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THE

PENNY CYCLOPÆDIA

OF

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FOR THE

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PREFACE TO VOLUME THE FIRST.

In the course of the regular publication of the Numbers and Parts of the Penny Cyclopædia, the purchasers of the work will have been enabled to compare its general execution with the announcements of the original Prospectus. The completion of a volume appears to call upon the Conductors for a few explanatory observations.

The plan of this work differs in a considerable degree from most other Cyclopædias. These have generally given elaborate treatises on each branch of knowledge, often referring for the explanation of each term, as it occurs in the alphabetical order, to the general treatise. The plan of the Penny Cyclopædia, as it is specially intended as a book of reference, is not to attempt to form systems of knowledge, but to give pretty fully, under each separate head, as much information as can be conveyed within reasonable limits. But whilst it endeavours to present in detail the explanation of those terms of Art and Science, the right understanding of which is independent of any system, it also attempts to give such general views of all great branches of knowledge, as may help to the formation of just ideas on their extent and relative importance, and to point out the best sources of complete information.

As this plan excludes all long essays and treatises, it necessarily leads to giving more ample space to the separate heads than is done in most Cyclopædias; and in doing this, it is often found difficult to determine the point where the selection of terms must end. This is particularly the case as to names of Persons and Places, which unavoidably form a large part of every book of general reference. It is hardly possible to fix any rule which will not either exclude something that ought to be admitted, or include names of very little importance. Something, therefore, must be left to the judgment of those who contribute to, and superintend, such a publication. It will be observed that the plan of the Cyclopædia has rather been enlarged, since the earlier Numbers, as to the names admitted, and somewhat also, perhaps, in the length of the more important articles. It would appear that, in the proper conduct of such a work, some practice and experience are peculiarly necessary. The difficulty of forming a complete and satisfactory list of words can only be estimated by those who have made the experiment. On looking into the best works of this class already published, it will be found that, while they all differ very considerably as to the words inserted, none are without some omission that would be better supplied. Nor can the Editors of the Penny Cyclopædia congratulate themselves on having inserted *every* term or name that ought to have found a place, though they hope that in the progress of the Work they will be better able to guard against any omission.

As to errors in the articles themselves, either of incorrect statements of facts, or of false deductions from premises, some such are unavoidable in every large work, however carefully the subject-matter has been weighed, or however scrupulously the writer may have discharged his duty. In a periodical publication, in which a number of writers are necessarily combined, and where the matter is almost infinitely varied, the causes of error are still more numerous. The experience of one year, however, enables the Conductors of this Cyclopædia to state with confidence, that whatever errors there may be in the first volume, (and they trust they are neither very nume-ous nor very important,) they feel no doubt that the work in its progress will continue to improve. At least, no exertions will be spared to procure sound information on all subjects, and to convey it in clear and perspicuous language. The Conductors have to express their thanks to numerous correspondents, both for valuable suggestions and criticisms, of which, in many cases, they have been enabled to avail themselves. In some instances, where the accuracy of statements has been called in question, they believe that the Cyclopædia is correct; and in other instances, the difference is no more than may be expected where authorities are at variance, and opinions may naturally be expected to differ somewhat as to their precise value. As most of the communications referred to were anonymous, the Editors have no other means of thanking the writers than by this general acknowledgment.

It may be necessary to mention that a few of the more trifling errors that are most obvious—such as the breaking off of a letter, or a stop at the end of a line—are the unavoidable consequence of the process of stereotyping. Before this process commences, the usual labour of revision is complete; but in producing the stereotype plate new errors are sometimes created. It is the intention of the Conductors of this Work to subject even the stereotype plates to a careful examination, so that injuries of this mechanical nature may be repaired.

In the commencement of their undertaking, the Editors, bearing in mind the difficulty of securing at once an efficient body of contributors, recommended to the Committee only to attempt the publication of Six Numbers in each month. Their present stock of materials, and their reliance upon their numerous coadjutors, founded upon ample experience, have induced them to desire that the work should proceed at a quicker rate. In this they feel satisfied that they only second the wishes of the great body of its purchasers. The work will therefore continue upon the following arrangements:—

1. The *First Volume* of the Penny Cyclopædia—containing Eleven Parts—is now concluded; and will be sold, handsomely bound in cloth, lettered, at Seven Shillings and Sixpence.

2. Commencing with December, 1833, *Two Numbers* of the work will be published *regularly every Week, without Supplements*, so that sometimes Eight, and sometimes Ten Numbers will appear in each calendar month.

3. On the 1st of January, 1834, *Part XII.* will be published, price *Ninepence*, and the *Monthly Parts* regularly continued at that price.

4. On the 1st of September, 1834, the *Second Volume*, containing Eight Ninepenny Parts, will be published, bound uniformly with Vol. I., at Seven Shillings and Sixpence;—and the future volumes will be completed every *Eight* Months.

November 13, 1833

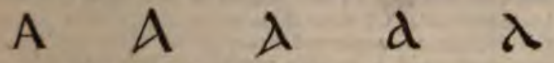
THE PENNY CYCLOPÆDIA

OF

THE SOCIETY FOR THE DIFFUSION OF
USEFUL KNOWLEDGE.

A.

A, the first letter of the alphabet in the English, and many other languages. As a sound, its power in the English language is at least fourfold, as in the words *father*, *call*, *tame*, and *hat*. The first of these sounds is that which generally prevails in other languages. The modified pronunciation of the vowel in *tame* is partly due to the vowel *e* at the end of the word; in *call* and similar forms, the peculiarity arises from the letter *l*; so that the only true sounds of the vowel are perhaps the long sound in *father*, and the short one in *hat*. The printed forms of this letter, viz., the capital A, the small character a, and the italic *a*, are all derived from a common form, differing but slightly from the first of the three. In the old Greek and Latin alphabets, from which our own has descended, the following were the ordinary figures of this letter:—



among which, the fourth and fifth only differ from the rest in the rounding of the angle: the form consisting of straight lines being well adapted for writing on stone, metal, &c.; the rounded letter, on the other hand, being better suited for expeditious writing, with softer or more flexible materials. From this last our two small characters are easily deduced.

A (in music), the sixth note in the diatonic scale, answering to the *la* of the Italians and French. It also stands for the *alto* parts.

A or AN, the indefinite article. Of the two, *an* is used before a vowel. Where the following word begins with a consonant, it being more troublesome to express the final *n*, this letter, from not being pronounced, ceased to be written. Thus we say *an emperor*, but instead of *an king*, we find it more convenient to say *a king*. Sometimes a virtual consonant exists at the beginning of a word without being written, as in *union* and *once*, where the ear catches the initial sounds of *y* and *w*, *younion* and *wunce*. Before such words it is customary to drop the final letter of the article, at least in pronunciation, and there can be no good reason for not writing *a union*, *a once beloved monarch*. On the other hand, whenever *h* is mute, we should retain the *n* both in writing and speaking, thus, *a history*, but *an historical work*. That *an* and not *a* is the primitive form of the article, is proved by the Anglo-Saxon *an*, and the German *ein*; indeed, our own numeral *one* is only another and fuller form of the same word. In such phrases as *three shillings a pound*, the article evidently has this meaning. The double shape of our article has led to a corrupt mode of writing certain words, thus from *an eft* was deduced *a neft*, *a newt*; and the reverse seems to have taken place in the change of *a nadder* to *an adder*. The letter *a* often appears prefixed to nouns so as to constitute a kind of adverb, as *afoot*, *aside*, *aboard*, *now-a-days*, &c. These, as Horne Tooke observes, are all abbreviations of *on fote*, *on syde*, *on borde*, *now-on-daies*, &c., which thus occur in our old English poets. This *on* is an Anglo-Saxon preposition with the meaning of *in*. In many words now in use the *a* in the beginning takes the place of *on*. Alive, for instance, means on life, *i. e.*, in life. 'So he fell asleep,' in the old translation of the New Testament is, *he fell on sleep*.

The *a*, formerly often prefixed to our participles in *ing*, both in the active and passive sense, as *the house is a-preparing*, *he is gone a-walking*, has the same origin.

AA, a small river which flows into the Ems, on the east bank, in the district of Lingen, which is in the kingdom of Hanover. The little town of Freeren stands on the Aa. The singularity of the name, rather than the importance of the river itself, deserves a short notice. *Aa* is possibly a corruption of the word *aue*, which means *green pastures* or *meadows*, and may also have been used to denote the low-flat lands along the banks of the river. *Aue* is the name of a small tributary of the Elbe, and also of a brook in the principality of Schaumbourg-Lippe. *Aue* is also the name of a mountain village, situated in a romantic valley of the Erzgebirg circle of the kingdom of Saxony.

AA, a branch of the Aar, in the canton Aargau; a small river of Jutland; also the name of one of the streams at the confluence of which Breda stands, and the name of a tributary to the Dommel in N. Brabant. The wide diffusion of such a name shows it must have some *general* signification, applicable to all the rivers to which it belongs.

The word *Aa* may be the same as *Aach*, the name of several German rivers, with the guttural *ch* dropped. The Celtic *Ac*, or *Ach*, water, is probably the origin of all these names.

AALBORG, one of the four divisions, and the most northern part, of the peninsula of Jutland, properly so called. It contains about 2820 English square miles, and perhaps about 130,000 inhabitants. The principal town, which is also called Aalborg, stands on the south side of the narrow channel which joins the Liimfiord with the sea, and is a sea-port, with a considerable trade in grain and herrings. From 400 to 500 vessels enter the port annually. The number of inhabitants is about 5300. Aalborg is a bishopric, and has a good academy or cathedral school founded in 1553, with some manufactures of leather, sugar, and tobacco. The name Aalborg means Eel-town, a great number of eels being caught in the neighbourhood: it is in N. lat. 57° 5′, E. long. 10° 5′. All the other towns of the district are small: Thistedt, the next in size, does not contain 2000 inhabitants.

AAR, the principal branch of the Rhine in Switzerland. [See AARGAU.]

Another small stream of the same name falls into the Rhine, in the duchy of Nassau; and a third Aar joins the Rhine in the Prussian province of the Lower Rhine, on the west side, about twelve miles above Bonn.

AARD-VARK (*Orycteropus*, Geoffroy*), in Zoology, a genus of animals belonging to the class *Mammalia*, and order *Edentata*.

In a work, like the PENNY CYCLOPÆDIA, where knowledge is communicated under separate heads arranged in alphabetical order, it is an unavoidable consequence of the general plan that terms must be occasionally employed which have not been previously defined, and of which, in a regular treatise, the explanation would necessarily precede the use. To obviate this inconvenience as much as possible, it is proposed, without entering into the minute details of the subject, or anticipating information which properly belongs to a different part of the work, to give a brief explanation of such terms as they occur; so that the general reader may be enabled to comprehend their meaning and import without the trouble of referring to other sources.

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* It is usual, in works of Natural History, to place the scientific name of a species after the popular or local name. By the scientific name the species is recognized in every country, while the popular or local name is limited in its use. But as the same species is often called by several scientific names, each of which has been given to it by a different naturalist, it is also usual to place the name of the naturalist after the word which he has invented or adopted. Thus, Aard-vark is the Dutch name of the animal in question; Orycteropus the scientific name by which it is commonly known; and Geoffroy St. Hilaire (generally abridged Geof.) the name of the naturalist who gave it that scientific denomination.

Before commencing the history and description of the genus which more properly constitutes the subject of the present article, we shall, therefore, give a short explanation of the terms *Mammalia* and *Edentata*, as well as of the technical import of the words *Class*, *Order*, *Genus*, and *Species*, which are of constant occurrence in Zoology: these terms would otherwise be obscure or unintelligible to an ordinary reader.

The word Mammal (Mammalia is the Latin form of the plural) was formed by Linnæus from the Latin mamma, signifying a breast or udder, in the same manner as our common word animal is formed from anima, life or soul; and was intended to denote those animals which suckle their young, and for which there is no generic name in any known language sufficiently definite and comprehensive. The common word Quadruped, which more nearly expresses the exact idea than any other, has no relation to the natural affinities which we observe among animals, since it excludes man and the cetaceous tribes (such as whales), at the same time that it comprehends the lizards, tortoises, and other reptiles, which have but a very remote analogy to the true Mammalia.

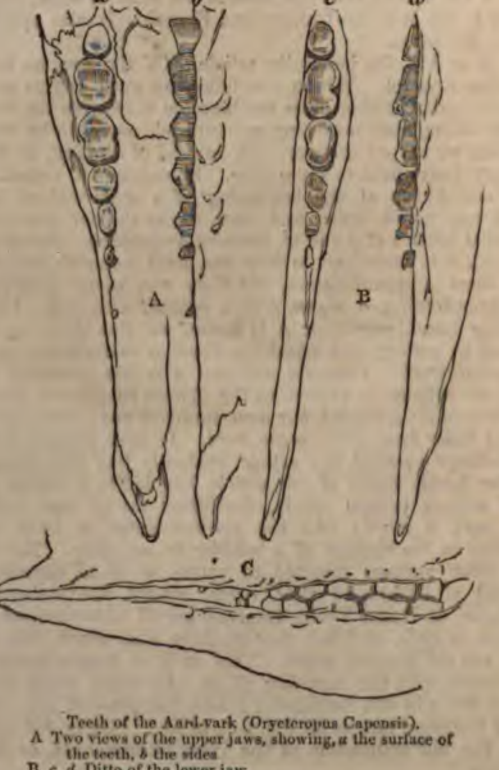
The vernacular term Beast, which we often use in opposition to Birds and Fishes, is still more vague and indeterminate. The word Mammal, however, so happily imagined by the great Swedish naturalist, is liable to none of these objections, but expresses, in a distinct and definite manner, the most prominent functions and natural limits of this class of animals. In the constant use which we shall be obliged to make of this term, we shall adopt the common English form of the plural, *Mammals*, instead of the Latin form, *Mammalia*, though the latter is most generally used by British zoologists. The word *Mammals* is as regularly formed, and therefore as admissible into the English language, as animal and animals.

Mammals, therefore, in the technical language of zoologists, constitute a *class*, or primary division of the animal *kingdom;* and are, in this respect, co-ordinate with Birds, Fishes, Reptiles, and Insects; all of which are so many *Classes*. The term *Order* denotes a subordinate division, and bears the same relation to a class which this latter does to a kingdom; so that a class is made up of orders, in the same manner as a kingdom is made up of classes. The next inferior sub-division to an order is a *Genus;* and this is itself composed of *Species*, the lowest link in the chain of scientific classification, and that which admits of no further division. A species, then, comprehends all those animals which may reasonably be supposed to be descended from one common, original stock; and in this sense all men compose but a single species, all horses compose but a single species; and in the same manner all oxen, sheep, goats, dogs, &c. compose respective and appropriate species. Difference of climate, variety of food, and other local and extraneous circumstances, undoubtedly produce striking changes in the form, size, and colour of different individuals, even of the same species; examples of which are sufficiently abundant among all domestic animals, and that, too, in exact proportion to the degree of their domestication, and to the care and attention which have been bestowed upon them by man. But these variations are confined within certain prescribed limits, and the utmost power and ingenuity of man have been exerted in vain to produce and perpetuate a new race or species of animals. He has succeeded, to be sure, in procuring the Mule from the intercourse of the Horse and the Ass, two very distinct species, though in some respects closely allied to one another; but this mule is itself a barren, unproductive being, which Nature regards as a monster, and to which she has denied the power of continuing its race.

An example will best illustrate the true import of the ms which we have been here endeavouring to explain. us the dog, the fox, the wolf, and the jackal, are all so ny *species* of one common *genus;* as are likewise the lion, the tiger, the panther, the lynx, and the common cat, species of another genus. These are respectively called the genus *Canis*, or the dog kind, and the genus *Felis*, or the cat kind; and compose, together with the hyænas, civets, weasels, bears, badgers, &c. the natural *Order* of *Carnivora*, or flesh eaters, which have six incisor or front teeth in each jaw, and live upon the flesh of other animals. Another natural order of Mammals comprises all those which, like the rat, the squirrel, the rabbit, and the guinea-pig, have only two large teeth in front, which they continually employ in gnawing whatever falls in their way; they are, therefore, called Rodentia, or gnawers. These, at least in the number of their incisor teeth, form the intermediate link which connects the Carnivora with the Edentata, or next order of Mammals, which are distinguished by having no front teeth at all, and are therefore constrained to live entirely upon a vegetable regimen, or upon insects, carrion, and other soft substances which require little cutting or mastication. These different Orders of Carnivora, Rodentia, and Edentata, together with the Ruminantia or ruminating animals, the Cetacea or whale kind, and others less important, which it is unnecessary here to enumerate, compose the *class* Mammalia.

Having thus briefly explained the signification of those technical terms which will occur most frequently in the subsequent Zoological articles, we shall return from this digression to the more immediate object of our present consideration.

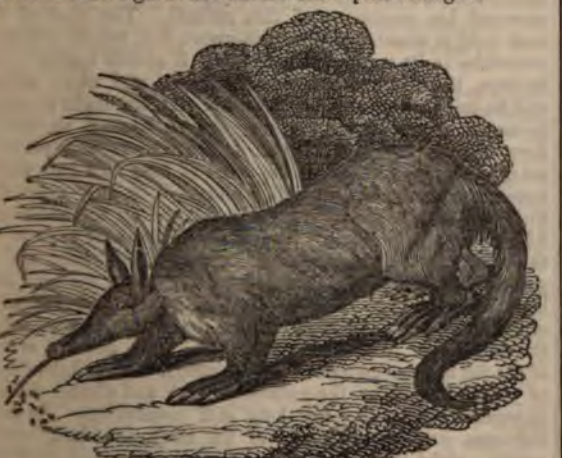
The Orycteropus is now separated from the Myrmecophaga, or Anteaters of Linnæus, with which it had been formerly associated. In its anatomical structure, it bears a much closer relation to the armadillos than to any other quadrupeds, not even excepting the ant-eaters, with which it was formerly associated. Like these animals, the orycteropus has neither incisors nor canine teeth; and its feet are equally provided with large and powerful claws, for digging up roots and insects, and for forming subterraneous burrows. Its molar teeth, however, are altogether peculiar both in form and structure, and have no resemblance to the teeth of any other known animal. Of these there are five large ones on each side (both in the upper and under jaws), which are always permanent; and a variable number of from one to three smaller ones, placed in front of the others, and apparently representing the false molars of ordinary quadrupeds. The first of the large molars is smaller than any of the other four, and of a cylindrical form, somewhat compressed or flattened on the sides; the second is rounder; the third and



Teeth of the Aard-vark (Orycteropus Capensis).
A Two views of the upper jaws, showing, *a* the surface of the teeth, *b* the sides
B, *c*, *d*, Ditto of the lower jaw.
C The teeth in their natural position,

fourth are each composed of two similar cylinders, as it were, soldered together, and the last is a simple cylinder, like the first and second. Immediately in front of these are the small or false molars, which, being of a deciduous nature (falling annually), vary in number according to the individual. In their internal structure these teeth differ from those of all other animals. They are pierced throughout their whole length with an infinite number of small capillary tubes, running in the same longitudinal direction, and opening at the root or under part of the teeth. The crowns or upper surfaces of the teeth are covered with enamel, but after this has been worn away by the continued process of mastication, as in very old animals, the openings of these small canals may be plainly distinguished upon the surface also; and in this state, the teeth, to use the appropriate comparison of Baron Cuvier, resemble the joint of a cane cut across, and exhibiting the numerous minute vessels which perforate its interior. Properly speaking, these teeth are destitute of real roots, and are therefore, like the tusks of the elephant, and the incisors of the rodentia, capable of being indefinitely increased, by the deposit of new matter on the under extremity, to counterbalance the continual wear of the upper surface.

In the form of the extremities the orycteropus resembles the armadillos still more nearly than in the nature of its dental system. The legs are remarkably short and stout; the feet plantigrade (that is to say, the animal walks upon the whole sole of the foot, as man and the bear, instead of bringing the point of the toe only in contact with the ground, as may be observed in the dog, horse, &c.); and the toes, of which there are four on the fore feet and five on the hind, are armed with extremely large, powerful claws, flattened horizontally, and scooped or hollowed out on the under surface, so as to form a most efficient instrument for digging and burrowing beneath the surface of the earth. This process is still further facilitated by the oblique form of the anterior extremities, arising from the unequal length of the toes; the two interior being considerably longer than the others, and the whole diminishing gradually from the index (or toe corresponding with the fore-finger) outwards. In other parts of its anatomy the orycteropus resembles both the armadillos and the ant-eaters, and particularly in the form and structure of the stomach and alimentary canal. The reader who is desirous of further information upon these subjects may consult Cuvier's *Leçons d'Anatomie Comparée*, and his great work *Sur les Ossemens Fossiles*, from which the details here given are for the most part abridged.



The only species of this curious genus with which zoologists are at present acquainted is the *Aard-Vark* (Orycteropus Capensis), called *innagu* by the Korah Caffres, and *goup* by the Hottentots. It is an animal extremely common in some parts of Southern Africa, though, from its nocturnal habits and extreme timidity, it is not so frequently seen as many others which are in reality scarcer. Its colonial name of aard-vark, or earth-pig, by which it is known among the Dutch inhabitants of the Cape of Good Hope, is derived as well from its habit of burrowing as from the general appearance which it bears, at first sight, to a small, short-legged pig. This animal, when full grown, measures about three feet five inches from the snout to the origin of the tail; the head is eleven inches long; the ears six inches; and the tail one foot nine inches. The head is long and attenuated; the upper jaw projects beyond the lower, and ends, as in the common hog, in a truncated, callous snout, having the nostrils pierced in the end of it; the mouth is small for the size of the animal, and the tongue flat and slender, not cylindrical as in the true ant-eaters, nor capable of being protruded to such an extent as in these animals: it is, however, covered in like manner with a viscous or glutinous saliva, which firmly retains the ants upon which the animal lives, and prevents those which once come into contact with it from escaping afterwards. The ears are large, erect, and pointed; and the eyes, which are of moderate size, are situated between them and the snout, about two-thirds of the distance from the extremity of the latter. The body of the aard-vark is thick and corpulent; the limbs short and remarkably strong; the hide thick, tough, and nearly naked, having only a few stiff hairs, of a pale reddish-brown colour, thinly scattered over it, excepting on the hips and thighs, where they are more numerous than elsewhere. The tail is about half the length of the body and head together, and, like the body, is nearly naked; it is extremely thick and cylindrical at the base, but decreases gradually towards the extremity, and ends in a sharp point.

Thus formed, the aard-vark is in all respects admirably fitted for the station which Nature has assigned to it in the grand economy of the animal kingdom. It feeds entirely upon ants, and in this respect fulfils the same purpose in Southern Africa which is executed by the pangolins in Asia, the myrmecophaga in America, and the echidna in New Holland. To those who are only acquainted with the size and nature of these insects in the cold northern climates of Europe and America, it may seem surprising how an animal so large as the aard-vark can support itself exclusively upon ants, and yet be invariably found fat and in good condition. But the ants and termites of tropical countries are infinitely more numerous than those which inhabit more northern latitudes, and so large as sometimes to measure an inch or an inch and a half in length. The bodies of these ants are, besides, of a soft, unctuous nature; and travellers inform us that the Hottentots themselves frequently collect them for food, and even prefer them to most other descriptions of meat. Patterson affirms that prejudice alone prevents the Europeans from making a similar use of them; and says that, in his different journeys, he was often under the necessity of eating them, and found them far from disagreeable. However this may be, their importance in fattening poultry is well understood at the Cape, and the farmers collect them by bushels for this purpose.

These insects raise mounds of an elliptical figure to the height of three or four feet above the surface of the ground; and so numerous are these gigantic ant-hills in some parts of Southern Africa, that they are frequently seen extending over the plains as far as the eye can reach, and so close together that the traveller's waggon can with difficulty pass between them. They abound more especially in the Zeurevelden, or sour districts, so called from producing a kind of sour grass; are seldom found on the karroos or downs, and never in very dry or woody districts. By constant exposure to the rays of a powerful tropical sun they become so hard and indurated on the outer surface that they easily support the weight of three or four men, and even a loaded waggon will sometimes pass over without crushing them. Internally these mounds are of a spongy structure, something resembling a honeycomb, and are so completely saturated with animal oil that they inflame without difficulty, and are an excellent substitute for wood or coal.

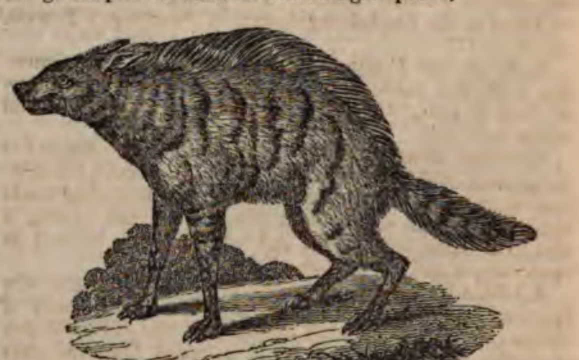
Wherever ant-hills abound the aard-vark is sure to be found at no great distance. He constructs a deep burrow in the immediate vicinity of his food, and changes his residence only after he has exhausted his resources. The facility with which he burrows beneath the surface of the earth is said to be almost inconceivable. We have already seen how admirably his feet and claws are adapted to this purpose; and travellers inform us that it is quite impracticable to dig him out, as he can in a few minutes bury himself at a depth far beyond the reach of his pursuers; and, further, that his strength is so great as to require the united efforts of two or three men to drag him from his hole. When fairly caught, however, he is by no means retentive of life, but is easily dispatched by a slight blow over the snout. The aard-vark is an extremely timid, harmless animal, seldom removes to any great distance from his burrow, being slow of foot and a bad runner, and is never by any chance found abroad during the day-time. On the approach of night he sallies forth in search of food, and, repairing to the nearest inhabited ant-hill, scratches a hole in the side of it just sufficient to admit his long snout. Here, after having previously ascertained that there is no danger of interruption, he lies down, and, inserting his long slender tongue into the breach, entraps the ants, which, like those of our own country, fly to defend their dwellings upon the first alarm, and, mounting upon the tongue of the aard-vark, get entangled in the glutinous saliva, and are swallowed by whole scores at a time. If uninterrupted, he continues this process till he has satisfied his appetite; but on the slightest alarm he makes a precipitate retreat, and seeks security at the bottom of his subterranean dwelling. Hence it is that these animals are seldom seen even in those parts of the country in which they are most numerous. Like other nocturnal animals, which pass the greater part of their lives in sleeping and eating, they become exceedingly fat, and their flesh is considered to be a wholesome and palatable food. The hind-quarters, particularly when cut into hams and dried, are held in great esteem, and are much sought after by colonial epicures.

AARD-WOLF (*Proteles*, Is. Geof.), in Zoology, a genus of digitigrade carnivorous mammals founded by M. Isidore Geoffroy St. Hilaire for the purpose of giving a place to a new and singular quadruped brought from the interior of Caffraria by the late traveller Delalande. The three specimens of this interesting animal procured by M. Delalande were all, unfortunately, of an immature age, and had not acquired their permanent teeth, so that the characters of their adult dentition still remain to be determined. Enough, however, is known to enable us to assign the most prominent and influential characters of the genus, and to infer, with a tolerable degree of accuracy, the habits and economy of the animal.

It is an observation at least as old as Pliny, that Africa is a land of wonders, which continually produces a succession of new and singular objects. In zoology, the maxim of the Roman philosopher, as to African wonders, is verified almost daily. Among the most recent examples of this fact we may adduce the discovery of the *proteles;* an acquisition of peculiar interest to the zoologist, as forming the intermediate link which connects the civets with the dogs and hyænas, three genera which have hitherto stood, as it were, insulated from surrounding groups, and widely separated from one another. The dogs and hyænas, indeed, had been united a short time previous by the discovery of an intermediate species in the same locality which has since produced the proteles; but it is this latter species alone, which, uniting the characters of all these three genera, enables us to trace their natural affinities, and to assign to them their proper position in the scale of existence.

To the external appearance and osteological (bony) structure of a hyæna, this truly singular animal unites the head and feet of a fox, and the teeth and intestines of a civet. It has five toes on the fore feet, and four only on the hind; the innermost toe of the fore foot is placed, as in the dogs, at some distance above the others, and therefore never touch the ground when the animal stands or walks. The legs also are completely digitigrade; that is to say, the heel is elevated, and does not come into contact with the surface, as in man and other similarly formed animals which walk upon the whole sole of the foot, and are thence said to be plantigrade. It is of great importance to remark the difference between these two modifications of the locomotive organs, because they have a very decided and extraordinary influence upon the habits and economy of animal life. Digitigrade animals, which tread only upon the toes and carry the heel considerably elevated above the ground, have much longer legs than plantigrade animals, and are therefore especially fitted for leaping and running with great ease and rapidity. Accordingly, it will be observed that the horse, the stag, the antelope, the dog, and other animals remarkable for rapidity of course, partake strongly of this formation; and even their degree of swiftness is accurately measured by the comparative elevation of the heel. Inattentive observers sometimes misapprehend the nature of this peculiar conformation of the extremities of digitigrade animals, and are apt to confound the hough with the ankle, and to mistake for the knee what is really the heel of the animal. Thus we have heard it said that, in the hind legs of the horse, the knee was bent in a contrary direction to that of man. This is by no means true: a little attention to the succession of the different joints and articulations will show that what is called the cannon-bone in the horse, and other digitigrade animals, in reality corresponds to the instep in man, and that what is generally mistaken for the knee really represents the heel.

In the particular case of the proteles the natural effect of the digitigrade formation is, in some degree, lessened by the peculiar structure of the fore legs, which, contrary to the general rule observable in most other animals, are considerably longer than the hind. In this respect, also, the proteles resembles the hyænas; and in both genera this singular disproportion between the anterior and posterior extremities abridges the velocity properly due to their digitigrade conformation. It has been already observed that the only individuals of this genus which have been hitherto properly observed were young specimens, which had not acquired their adult dentition; but it was sufficiently obvious to the experienced eye of M. Cuvier, who first examined them, that the dental system of the mature animal must very closely resemble, if it be not actually identical with, that of the civets and genets. The young animal presented three small false molars and one tuberculous tooth on each side both of the upper and under jaws; and we shall find, in the sequel, that the approximation of M. Cuvier is fully justified by the evidence of another accurate observer, who had an opportunity of examining this animal in its native regions. The genus proteles contains but a single species, the *Aard-wolf*, or earth-wolf (*Proteles cristata*), so called by the European colonists in the neighbourhood of Algoa Bay, in South Africa, the locality in which M. Delalande procured his specimens of this animal. The size of the aard-wolf is about that of a full-grown fox, which it further resembles in its pointed muzzle; but it stands higher upon its legs, its ears are considerably larger and more naked, and its tail shorter and not so bushy. At first sight it might be easily mistaken for a young striped hyæna, so closely does it resemble that animal in the colours and peculiar markings of its fur, and in the mane of long stiff hair which runs along the neck and back: indeed, it is only to be distinguished by its more pointed head, and by the additional fifth toe of the fore feet. The fur is of a woolly texture on the sides and belly, but a mane of coarse, stiff hair, six or seven inches in length, passes along the nape of the neck and back, from the occiput to the origin of the tail, and is capable of being erected or bristled up, like that of the hyæna, when the animal is irritated or provoked. The general colour of the fur is pale cinereous (ash-coloured), with a slight shade of yellowish-brown: the muzzle is black and almost naked, or covered only with a few long stiff moustaches. Around the eyes, and on each side of the neck, are dark brown marks; eight or ten bands of the same colour pass over the body in a transverse direction, exactly as in the common striped hyæna; and the arms and thighs are likewise marked with similar transverse stripes. The legs and feet are an uniform dark brown in front, and grey behind. The long hairs of the mane are grey, with two broad rings of black, the second of which occupies the point; those of the tail are similarly marked, and equally long and stiff; whence it appears as if the mane and tail were clouded with an alternate mixture of black and grey. The ears are grey on the interior, and dark brown on the outer, surface.



In its habits and manners the aard-wolf resembles the fox: like that animal it is nocturnal, and constructs a subterraneous burrow, at the bottom of which it lies concealed during the day-time, and only ventures abroad on the approach of night to search for food and satisfy the other calls of nature. It is fond of the society of its own species; at least, many individuals have been found residing together in the same burrow; and, as they are of a timid and wary character, they have generally three or four different entrances to their holes, so that if attacked on one side they may secure a retreat in an opposite direction. Notwithstanding the disproportionate length of their fore legs they are said to run very fast; and so strong is their propensity to burrow, that one of M. Delalande's specimens, perceiving itself about to be run down and captured, immediately ceased its flight, and began to scratch up the ground, as if with the intention of making a new earth.

M. Isidore Geoffroy St. Hilaire, in his paper on the Proteles, inserted in the eleventh volume of the *Mémoires du Muséum*, has bestowed upon this species the name of *Proteles Lalandii*. He has done so, in the belief that the species has not been indicated by any previous traveller. We have considered it proper, however, to substitute the specific name of *Proteles Cristata*, for that proposed in honour of M. Lalande, for both Sparrman and Levaillant have mentioned the aard-wolf long before the date of M. Delalande's journey; and the former has not only described it with tolerable accuracy, but has even ascertained its true generic characters, and associated it with the civets, under the denomination of *Viverra cristata*. The passage alluded to will be found in the English translation of *Sparrman's Travels*, vol. ii., p. 177.

In the *Second Voyage* of Levaillant, vol. ii., p. 360, mention is likewise made of this animal under the appellation of 'loup de terre,' which is a simple translation of its colonial name aard-wolf.

Sparrman mentions having found ants in the stomach of the proteles, and these, it may be observed, are also a favourite food of the bear. The dental system of this animal would further lead us to suppose that, like the fox and hyæna, it also feeds upon wild grapes and bulbous roots, as well as upon carrion and the produce of the chase.

AARGAU, one of the twenty-two Swiss cantons. On the north the Rhine separates it from the grand duchy of Baden: the canton of Basel bounds it on the west, and that of Zürich on the east. It takes its name from the river Aar, which rises in the glaciers that form the southern limits of the canton of Bern; and, after flowing through the lakes of Brienz and Thun, and past the towns of Bern, Soleure, and Aarau, falls into the Rhine on the south bank, about fourteen miles above Laufenburg. The whole length of its course is about 160 miles. The canton takes its name from the river, the word *Aar-gau* signifying the *province* or *district* of the Aar: the same termination frequently occurs in other names, such as Thurgau.

The canton of Aargau is a pleasant, and in many parts a fertile, district, diversified by hills, mountains, and valleys. The chain of the Jura mountains runs through part of the canton, but they hardly attain the height of 3000 feet. The number of inhabitants is about 152,900. Aargau is one of the most industrious cantons of Switzerland, and perhaps more a manufacturing than agricultural country. This canton has paid great attention to the education of its people. The chief town is Aarau, which contains 4000 inhabitants; and has manufactures of silk, cotton, and leather; and good establishments for education. At Laufenburg are some falls in the Rhine, which impede the navigation of the river. A bridge here leads over the Rhine to the little village of Laufenburg, in Baden. Aargau contains many neat, industrious towns; such as Zofingen with a good library, Lenzburg, Klingnau, Schinznach having near it the castle of Hapsburg, which is the original seat of the Imperial Austrian family, and Baden, which has warm baths, and a good Lyceum. Each of the eight districts into which Aargau is divided has a secondary school. [See *Journ. of Educ.*, No. 6.] The area of the canton is estimated at about 770 English square miles, in Hassel's Statistics.

AARHUUS, a division of Jutland, containing 1800 English square miles, and 88,000 inhabitants; with a considerable portion of good soil. Aarhuus, the chief town, stands in N. lat. 56° 10′, E. long. 10° 22′, between the sea and a small lake, which, at its outlet, forms a port. The town is pretty well built, and contains a large cathedral church: the manufactures are cotton and woollen cloth, gloves, sugar-refining to a small amount, tobacco, and leather. The number of inhabitants is about 6000. Aarhuus is the point in Jutland from which passengers generally set out to the island of Zealand, where they land at a place called Kallundborg, whence a road leads to Copenhagen. Aarhuus is about 100 miles W. N. W. from the capital. Randers, N. N. W. of the town of Aarhuus, on the Guden, a small navigable river, has about 5000 inhabitants, whose branches of industry are similar to those of Aarhuus, with the addition of stockings and brandy-distilleries. Randers has a grammar-school and good hospital.

AARON, the first high-priest of the Jews. He was the elder brother of Moses, and was, by the express appointment of Heaven, associated with that illustrious legislator in the enterprize of delivering their countrymen from Egyptian bondage, and conducting tnem to the promised land. Aaron, who was a ready and eloquent speaker, was the chief instrument employed in announcing the command of God to Pharaoh, and attesting it by the series of stupendous miracles recorded in the earlier chapters of the book of Exodus. After the passage of the Red Sea, and during the sojourn in the wilderness, he was far from manifesting the steady confidence and undaunted disregard of popular clamour which characterized the conduct of his brother: but, notwithstanding the timidity and weakness which he had shown in yielding to the demand of the impatient and superstitious multitude, that he would make them a golden calf to worship, he was, in conformity to the divine purpose, consecrated to the priesthood, of which the highest office was made hereditary in his family. Aaron, however, was not permitted to reach the promised land, any more than his brother Moses. Having ascended the summit of Mount Hor, in company with Moses and his eldest son Eleazar, he died there, after Moses, as commanded by God, had stripped him of his sacerdotal robes, and put them upon his son. This event happened when Aaron was in the hundred and third year of his age, forty years after the departure of the Israelites from Egypt, and, according to the commonly received chronology, in the year 1451 B. C., or 2553 from the creation of the world.—The history of Aaron is to be found in the book of Exodus, and the three following books of the Pentateuch.

AARON, the fifth caliph of the race of the Abassides, born 765, died in 802.—[See ABASSIDES.]

AB, the fifth month of the ancient Hebrew year, but now the eleventh (or, in intercalary years, the twelfth), in consequence of the transfer of the new year from spring to autumn.

On the 1st day of Ab a fast is held in commemoration of the death of Aaron. On the 9th a very solemn fast is observed in remembrance of the destruction of the Holy Temple by Nebuchadnezzar in 588, B. C., and of the destruction of the second Temple by Titus, A. D. 70. This fast is considered the most mournful of the whole year: on this day, in the synagogues, the lamentations of Jeremiah are publicly read, with other portions of the Bible, expressive of sorrow and desolation. No recreation is allowed from the beginning of the month, nor may any man shave his beard. the more serious Jews even abstain from all meat, except on the Sabbath-day. On the 18th, another fast is observed. All these fasts are postponed one day if they fall on the Saturday.

A little festival is celebrated on the 15th day of the month to commemorate an ancient custom, according to which, the young girls of each tribe came forth into the fields clothed in white, and exhibited themselves in dances before the marriageable young men, with the view of being selected by them in marriage. This festival is called Tub-ab, or the fifteenth Ab, the word Tub expressing the characters T and B, or 6 and 9, used by the Jews for fifteen.

The month of Ab may begin in some years as early as the 10th July, in others as late as the 7th August. In 1833, it commences on the 17th July.

Ab is the name of the twelfth month of the Syrian year coinciding with our August.

ABABDE, the name of several African tribes, which occupy the country between the Nile and the Red Sea, south of Kosseir, nearly as far as the latitude of Derr, 22°. 47′. The Bisharye inhabit the mountains from thence southwards. Many of the Ababde have settled in Upper Egypt, on the east bank of the Nile, from Kenneh to Assouan, and thence to Derr. According to Belzoni, some of them are spread as far as Suez. But the greater part still live like Bedouins, and act as guides to the Sennaar caravans which set out from Daraou, a place about ten hours' journey north of Assouan. The Ababde formerly guarded the caravans from Kenneh to Kosseir, on the Red Sea;

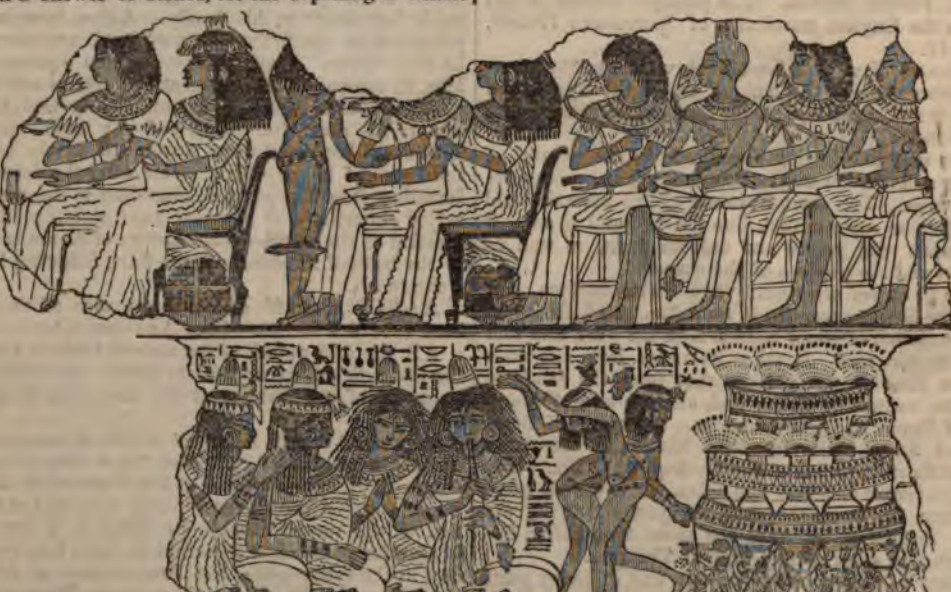
but they have been deprived of this branch of profit by the Maazu and Ataony Arabs, who live to the north, and farm the profits of this line of road from the Pasha.

The Ababde have considerable property, but a very bad character; they are described as faithless, and unworthy of the Bedouin origin of which they boast.

These people are known in Upper Egypt for their excellent camels, and particularly for their dromedaries. They trade principally in senna leaves, and charcoal made of acacia wood, which is sent as far as Cairo. The Ababde have few horses; they fight with other Arab tribes upon camels. Their arms are a target, lance, and sword. They are divided into three principal tribes, El Fokara, El Ashabat, and El Meleykab.

Those who encamp with the Bisharye speak the language of the latter. The female children of the Ababde and Jaafere Arabs, as Burckhardt calls them, who inhabit the west bank of the Nile, south of Thebes, as far as the first cataracts, as well as the female children of all the people south of Kenneh and Esne to the borders of Sennaar, undergo the operation of excision, which was an old Egyptian custom. [Compare Strabo., p. 824, Casaub.] The Ababde fight naked, except that they have a rag or napkin round their waists. A fight which Burckhardt saw commenced with a shower of stones, for the repelling of which missiles, their targets appeared very useful. The combatants on each side were about thirty; and the results were, three men slightly wounded, and one shield cleft in two.

This account is from Burckhardt's *Travels in Nubia* (London, 1819), who appears, from this and other passages, to consider the Ababde as of Arab stock; but if this be his meaning, it seems to be incorrect. Other writers say that the Ababde, who are of the same family as their southern neighbours, the Bisharye, differ in appearance, habits and language from the Arabs. The latter fact might readily be established by a comparison of an Arabic and Ababde vocabulary; but we have not been able to find one of the latter language. That the Ababde have, at different periods, mixed with the Arabs is certain, and we believe have got their religion, such as it is, from the same nation. Their form, which is not that of the negro, their dark colour, and their long hair besmeared with grease, and hanging in ringlets, which have been compared in shape to corkscrews, show them to be of Nubian stock, and probably the remnant of a race long settled in these regions. The kind of head-dress which they wear is often seen on the Egyptian monuments, and a pretty correct notion of it may be formed from the following Egyptian painting, now in the British Museum.



The fact of the Ababde being camel-breeders, and using them in battle, coincides singularly with the habits of the *Arabians*, as Herodotus calls them, who lived south of Egypt, and were in the army of Xerxes when he invaded Greece, B.C. 480.

It is conjectured by Ritter, that the Ababde, as well as the Bisharye, may be a remnant of that people, whom we hear of under the Roman Emperors by the name of Blemyes. We hear no more of the Blemyes after the Arab conquest of Egypt, but they appear under the general name of Bejas, as the great carriers between the Nile and Aidab on the Red Sea, and, in fact, as a commercial people. The Bisharye, the Ababde, Barabras, &c., may be considered as different branches of the Beja stock. [See Bejas.] What reasons Herodotus had for calling the camel-riding people south of Egypt by the name of Arabs, it is difficult to say; only we may observe, that Arabia, properly so called, was then very little known; and the word Arabs would be applied vaguely, and perhaps sometimes incorrectly, to many people, who lived a nomadic life. For many Ababde customs, see Belzoni's *Researches*, p. 309, 4to. [See Ritter's *Geography*, Africa.]

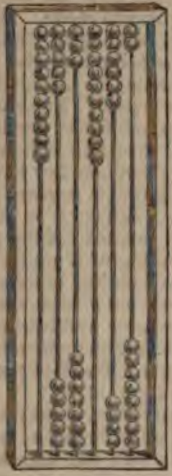
ABACISCUS, in architecture, is a diminution of the architectural term Abacus, and is principally applied, when used at all, which is not often, to the tiles or squares of a tessellated pavement.

A'BACUS, in architecture, is the level tablet, whether square or oblong, which is almost always formed on the moulded or otherwise enriched capital of a column, to support the horizontal entablature. [See the words Capital, Column, and Entablature.] The architectural application of the term Abacus, which in the original is applied to any rectangular tile-like figure, arises from a story which Vitruvius tells of the manner in which the foliated capital called the Corinthian originated.

A'BACUS, a game among the Romans; so called from its being played on a board, somewhat in the manner of chess.

A'BACUS, an instrument employed to facilitate arithmetical calculations. The name may be given with propriety to any machine for reckoning with counters, beads, &c., in which one line is made to stand for units, another for tens, and so on. We have here given the form of an abacus, such as we may recommend, for the purpose of teaching the first principles of arithmetic, the only use, as far as we know, to which such an instrument is put in this country. Its length should be about three times its breadth. It consists of a frame, traversed by stiff wires, on which beads or counters are strung so as to move easily. The beads on the first right hand row are units, those on the next tens, and so on. Thus, as it stands, the number 57048 is represented upon the lower part of it.

For a more detailed account of the method of using this instrument for the purposes of instruction, see Numeration. There is an instrument sold in the toy-shops with twelve wires, and twelve beads on each wire, for teaching the multiplication-table, which may be made of more use if applied according to the method which will be described in the article referred to.



The abacus can never be much used in this country, owing to our various division of weights and measures. We should need one abacus for pounds, shillings, and pence; another for avoirdupois weight; a third for troy weight, and so on. In China, however, where the whole system is decimal, that is, where every measure, weight, &c., is the tenth part of the next greater one, this instrument, called in Chinese Shwanpan, is very much used, and with most astonishing rapidity. It is said that while one man reads over rapidly a number of sums of money, another can add them so as to give the total as soon as the first has done reading. Their abacus differs from the one described above, in having only five beads on each wire, one of which is distinguished from the rest either in colour or size, and stands for five. There is one of these instruments in the East India Company's Museum. The Greeks and Romans used the same sort of abacus, at least in later times. The Russians are also much in the habit of performing calculations by strings of beads. It is probable that the word was originally applied to a board strewed with dust or sand, on which letters were marked in teaching children to read. The word *Abax* was the Greek term for this instrument. Some etymologists derive the name from the Phœnician *Abak*, which signifies dust. Lucas de Burgo, an old algebraical writer, says it is a contraction of Arabicus. It is most probable, however, that the first derivation is correct. A chequered board, such as we still sometimes see at the doors of public-houses, was formerly used in this country as an abacus [see EXCHEQUER], and a chess-board would now do very well for the purposes of instruction above-mentioned. The multiplication-table is sometimes called the Pythagorean abacus.

ABANDONMENT is a term used in marine insurance. Before a person, who insures a ship or goods, can demand from an insurer or underwriter the stipulated compensation for a total loss of such ship or goods, he must *abandon* or relinquish to the insurer all his interest in any part of the property which may be saved. [See INSURANCE.]

ABA'NO, PETER DE, a celebrated Italian physician and philosopher of the middle ages. He was born in 1250 at Abano, anciently Aponus, a village about five miles from Padua. Peter de Abano, or Apono as he is often called, having repaired to the University of Paris to complete his education, is said, while studying there, to have published the most famous of his works—his *Conciliator Differentiarum Philosophorum et Medicorum*, a performance from which he has derived the title of the *Conciliator*. He afterwards wrote various other works which are less known, and also translated into Latin some of the treatises of the Arabian physicians. Abano was undoubtedly one of the most accomplished scholars and men of science of his age; and he also seems to have been possessed of native powers and an inventive genius. As it was, he has been regarded as one of the principal restorers of true science in his native country. After he left the University of Paris, where he took the degree of Doctor both in Philosophy and in Medicine, he settled at Bologna, where he practised as a physician for the remainder of his life. Abano was also a great proficient in mathematics and astronomy, so far as those sciences were known in that age. His reputed skill in this kind of learning caused him to be regarded, in his own day, as a magician; and, in his latter years, a process was actually commenced against him as such by the Inquisition. An inscription on a statue which the citizens of Padua erected to him after his death, asserts that he was suspected of magic and accused of heresy, but acquitted. Other authorities, however, assure us that he only escaped condemnation by his death, in 1316, at the age of sixty-six; and that the sentence, which would have been passed upon him if he had lived, was executed upon his effigy in straw. The imputation of being a practiser of magic long clung to the memory of Abano in the popular belief, and even in the minds of many of the learned. As one of the many distinguished cultivators of mathematical and physical science who have acquired this sort of celebrity, he occupies a conspicuous place in the curious work which the French physician, Gabriel Naudé, published in the early part of the seventeenth century, entitled *A Vindication of the Great Men who have been accused of Magic*. Abano, however, although no student of magic, shared the universal belief of that and several succeeding ages in the delusions of astrology, and had no doubt that the movements of the stars exercised the most important influence on human affairs. The calculation of these imaginary sympathies formed, indeed, the principal part of his astronomy. The mysterious and almost prophetic character which he and others thus professed to derive from their scientific skill, must no doubt have helped, in a considerable degree, to countenance and confirm the popular notion of their intercourse with the powers of darkness. [See *Bayle's Dictionary*—Abano.]

ABATEMENT. This word is derived from the old French word *abater*, which signified to beat down, prostrate, or destroy.

Before entering upon the explanation of the present meaning of this term, it will be well to observe, for the information of those who may not be acquainted with the history of our law, that by far the greater number of the terms of art (as they may be called) peculiar to it, are derived either from the Norman-French, or the Latin,—we shall therefore give a cursory view of the circumstances which led to their adoption. When William I., commonly styled the Conqueror, became King of England, he filled all the posts of profit and honour with subjects from his Norman dominions —the civil places chiefly with ecclesiastics. The foreign priests having obtained from their master all the seals of the judges and other officers of the superior courts of justice, it was found necessary to ordain that all proceedings in them should be carried on in the Norman tongue instead of the English, with which these new judges were for the most part altogether ignorant. This practice continued until Edward III. conquered the armies of the French in their own country, and abolished the use of their language in the courts of justice here. At the same time that all arguments and judgments of law were spoken in French, the written parts of the proceedings, such as the writs and records, were all in the Latin language, with which the priests of the Roman Church were necessarily more or less acquainted. The judicial *writings* continued to be in Latin long after Edward III. had expelled the French tongue from our courts; and they were not written in our own language until the reign of George II., when an Act of Parliament was passed for the purpose.

It will be evident that, under the circumstances described, the more ancient legal terms would, whenever that could conveniently be done, be translated into the French and Latin languages; and as, during the periods mentioned above, the laws of England experienced great alterations and received many additions, abundance of new terms were necessarily called for to express new notions, and were naturally drawn from the languages then in legal use. Many of the expressions thus translated, and those first invented, are employed at the present day with little or no alteration. Of this we have an example in the word which is the subject of this article.

The term *Abatement* is used by our law in three senses viz. those of abating a nuisance, abating an action or indictment, and abating into a freehold.

The first of these, in which the word seems to be used in its primitive or literal sense, is that of abating or *beating down* a nuisance; an expression commonly used, and, therefore, well understood. Whatever unlawfully annoys, or does damage to another, is a nuisance, which he is at liberty to abate, that is beat down, and remove; provided in so doing he commits no breach of the peace, and does no more injury to the property than is absolutely necessary for effecting his purpose. If a new house or a wall be erected so near to an old house as to obstruct its ancient lights, this is a private nuisance, which it is competent to the person injured peaceably to abate: or, if a gate or other obstruction be erected or placed across a public road, this, which is a public nuisance, any of the king's subjects passing that way may beat down and remove.

The second signification of abatement is that of abating a civil action, or an indictment. Here it is taken figuratively, and signifies the beating down or overthrowing such action or indictment. This is effected in an action at law, either by showing, by way of plea, that something has occurred by which the proceeding is *ipso facto* determined, or by stating some matter which renders it imperative on the court to quash, or put an end to, the proceedings. Thus, in the first case, it may be alleged that the plaintiff has taken possession of the property which he seeks by his suit to recover from the defendant. In the second case, it may be shewn that the plaintiff in such proceedings is an alien, an outlaw, or an attainted or excommunicated person, and therefore incompetent by the law of England to maintain an action; or that the defendant is privileged from action, or has been misnamed in the suit; or that there are other persons still living who are equally liable with the defendant, and ought, therefore, to be joined with him in the demand; or that the plaintiff is disqualified from suing by some personal disability, or that the plaintiff or defendant is misnamed. In the former of these cases, the plea informs the court that the action is no longer pending—is already of itself abated by one of the parties, without the interposition of the court: in the latter it calls upon the court to pronounce a judgment which shall put a stop to the present proceedings, without deciding anything upon the main question in dispute between the parties. Where the defendant pleads any matter in abatement which lies peculiarly in his own knowledge, such as his own misnomer, or the non-joinder of other parties as defendants, it is, in general, necessary that the plea should be so framed as to give to the plaintiff that information which shall prevent his falling into a similar mistake, when commencing a new action for the same demand. This is technically called giving the plaintiff a better writ. It is an indispensable rule, where the action is only abateable by plea, that he who takes advantage of a flaw must, at the same time, show how it can be amended. This is, of course, not required where the action is actually abated, and where the plea, though in form a plea in abatement, is substantially a plea in bar, and shows, not that the particular proceeding is misconceived, but that the plaintiff has no *right* to recover by his action the thing which he has claimed.

In the early history of our law, as recorded in the Year Books, the most numerous subjects of discussion are questions arising upon pleas in abatement; and many important legal points were settled in considering whether a writ had or had not abated in fact, or was or was not abateable. Of late years a variety of causes, which cannot be explained without involving the consideration of matters scarcely intelligible to any but a professional reader, have conspired to render pleas in abatement in civil actions of much less frequent use than they formerly were.

The subjects of pleas in abatement, in criminal proceedings, are far more confined than in civil actions. In general, if an indictment assign to the defendant no Christian name or a wrong one, no surname or a wrong one, or no addition, or description of his calling and place of abode, or a wrong one, he may plead this matter in abatement. In modern times, however, misnomer is the only case in which a plea in abatement to an indictment has been at all usual in practice; and, at the present day, such a plea would be of no avail to a defendant,—a statute (7 Geo. IV. c. 64, s. 10) having been lately passed which gives authority to criminal courts of justice to amend the indictment according to the truth upon such a plea being made, and then to call upon the party to plead to the substance of the charge.

The learning upon pleas in abatement, as distributed through the Year Books, is well analysed by Thelwall in his *Digest*; and a full analysis of the law of abatement, in its more modern form, will be found in Comyn's *Digest*—title Abatement. [See also Bacon's *Abridgment*—Blackstone's *Commentaries*, vol. iii. p. 301; vol. iv. p. 334—Stephen on *Pleading*—Jacob's *Law Dictionary*.]

The last species of abatement is that of an abatement into a freehold, wherein, as in the last case, the term abatement is used in a figurative sense. Where, upon the death of a person possessed of freehold lands, another who has no title enters upon those lands to the prejudice of the party entitled as heir or devisee, he is said to abate into the freehold of such heir or devisee. In a state of nature, perhaps, upon the death of an individual who had occupied land, the next person entering upon it would have a better title than any other individual; but our law has, for the preservation of the public peace, given to a man possessed of land the power of nominating a successor as devisee; and in case of his not doing so, has pointed out the person who shall take as heir; and the entering of a person not entitled by either of the methods allowed by law is termed an abatement into the freehold; and this act of intrusion, or interposition between the former possessor and his heir or devisee, is justly considered one of the highest offences which can be committed against the right of freehold property. [Blackstone's *Commentaries*, vol. iii. pp. 167-8.]

ABATIS, a military term, signifying a work composed of felled trees, with the softer branches cut off, laid side by side with the end from which the branches grow towards the enemy; thus forming an obstruction to his progress, and a breast-work for musketry to fire over. This species of defence is often used in fieldworks, where wood, not of too great size, is plentiful. Lines, flanked by bastions, are thus formed, either simply by laying down and fastening the trees, or, if when so placed they would be too high to fire over, by sinking them in a ditch whose section is an angle, with its longest slope towards the enemy. They are sometimes formed against the counterscarp of a rampart, sometimes in the covered way, and may generally be used wherever an obstruction is to be raised to the enemy's progress, provided they can be flanked by a fire sufficient to prevent his destroying them at his leisure.

ABATTOIR, the name given by the French to the public slaughter-houses, which were established in Paris, by a decree of Napoleon, in 1810, and finished in 1818. Paris, previous to the arrangement thus made for the public health and comfort, was, as London now is, subject to the nuisance of having cattle driven through a crowded city, to be slaughtered in yards and hovels of the closest streets. But that capital was not still further exposed, as our metropolis is, to the frightful annoyance of a great cattle-market, held in the very heart of the city: the cattle were bought and sold at the adjacent villages of Scéaux and Passy. Assuredly, the beast-market of Smithfield, and the slaughter-houses of Warwick-lane, and of many other thoroughfares, are evils which ought not to exist in a period of high civilization. The abattoirs of Paris are five in number; three being on the right bank of the Seine, and two on the left. These buildings, which are of very large dimensions, consist of slaughter-rooms, built of stone, with every arrangement for cleanliness, and with ample mechanical aids; and of ox and sheep pens. Each butcher has stalls set apart for his beasts, and conveniences for securing his own forage. A fixed price is paid for the accommodation of the building, and for the labour of the persons engaged in the usual duties of the establishment. In 1824, these payments from the butchers of Paris amounted to a million of francs—about 40,000*l*. When it is considered that about two million head of sheep, oxen, calves, and hogs, are annually slaughtered in London, it is evident that the most serious inconveniences must result from the continuance of the system in which we have so long persevered; and that the establishment of beast-markets, and public slaughter-houses, in suburbs where the population is least dense, would be a measure of great utility. [See *Dulaure, Histoire de Paris*, tom. ix.]

ABAUZIT FIRMIN, born 1679, died 1767, aged 87. His family was descended from an Arabian physician who settled at Toulouse in the ninth century. He was born at Uzès in Languedoc, of Protestant parents in good circumstances, and lost his father when he was only two years of age. In 1685, after the revocation of the Edict of Nantz, he and his brother were seized by the authorities for the purpose of being educated in the Catholic faith. After some time, however, his mother was enabled to effect his escape, and send him to Geneva. For this she was imprisoned, until she also contrived to escape and follow her son. Abauzit applied himself closely to study, and attended to almost every branch of human knowledge. In 1698 he visited Germany, Holland, France, and England, and gained the esteem of many eminent men, among others of Bayle and

Newton. King William wished to retain him in England, but he decided to return to Geneva. There he took part in the translation of the New Testament, which appeared in 1726, and received the thanks of the clergy for his exertions. The Academy offered him a professor's chair in 1723, which he declined, preferring the situation of a supernumerary librarian, without salary. In 1727 the government of Geneva bestowed on him the rights of citizenship. He is one of the most remarkable instances on record of a combination of universality and depth of learning. Every man who talked with Abauzit on his own particular study, imagined that, whatever his general learning might be, his special attention had been reserved for that which they were discussing. Newton addressed himself to Abauzit as a proper person to decide between him and Leibnitz. Pococke, the Oriental traveller, thought he had passed his life in the east. Rousseau imagined that he had devoted himself to the study of ancient music. The latter speaks of him in terms of the highest admiration in his *Héloïse*, being the only instance in which he has thus distinguished a contemporary. In his temper he was so mild and enduring, that an anecdote which is preserved of him shows that those virtues had reached an excess which almost entitles them to the appellation of a disease of the mind. His friends bribed or encouraged his servant to try what lengths he might go with his master. The man, accordingly, neglected to make his bed, of which Abauzit reminded him without reproof. The same neglect, however, was allowed to occur several days running; on which Abauzit called the servant, and said, 'You appear not to like to make my bed; perhaps you think it too much trouble; it is, however, no great matter, as I begin to accustom myself to it.' For a man of his attainments we have not much remaining of Abauzit. With the exception of some antiquarian papers, in Spon's *Histoire de la Ville de Genève* and the *Journal Helvétique*, he printed nothing himself. Some theological works were published after his death, but the greater part of his manuscripts were burnt by his heirs, whose religious opinions differed from his own, which were Unitarian.—[Mostly abridged from the *Biographie Universelle*.]

ABBAS the Great, or, with his full name, Shah Abbas Bahadur Khan, was the fifth king of the Sufi dynasty which ascended the throne of Persia in the year 1501 of our era. During the latter part of the reign of Shah Mohammed Khodabende, his father, he filled the situation of governor in the province of Khorasan; and on the death of that prince in 1586, succeeded him in the government. Khorasan had just then been occupied by the Usbeks, and it was the first object of Shah Abbas to recover possession of it. But his efforts proved for a time ineffectual. Not being able to take Herat, the capital of Khorasan, from the Usbeks, he was obliged to content himself with leaving a garrison at Meshhed, and even this town, considered as sacred by the Shiites on account of the tomb of a celebrated Mohammedan saint, Imam Ali Reza, fell again into the hands of the enemy. About the same time the internal peace of Persia was interrupted by a revolt at Istakhar, which was, however, soon repressed, and terminated with the execution of the prime mover, Yakub Khan. The year 1590 was distinguished by victories in Gilan and Azerbijan over the Turks, who had collected a considerable force on the banks of the river Kur, and threatened Persia with an invasion. The Turks lost, through this campaign, their influence in Gilan, but retained for the present possession of the fortresses of Nuhavend, Tebriz, Tiflis, and almost the whole of Azerbijan and Georgia. During this time, one of the generals of Abbas conquered the province of Lar in the south, and the Bahrein islands in the Persian gulf, important on account of their pearl-fishery.

The Usbeks still remained masters of Khorasan, and, owing to their desultory mode of carrying on their attacks, many attempts at bringing them to a regular action had failed. At last, however, in the year 1597, they were totally defeated by the Persian troops, near Herat, and Khorasan was for a long time released from their predatory incursions.

Two English knights, Sir Anthony, and his brother Sir Robert Sherley, arrived about this time as private travellers in Persia. They were honourably received by Shah Abbas, whose confidence they soon gained to such a degree, that while Sir Robert Sherley remained in Persia, his brother Sir Anthony was sent as envoy from the Persian court to the Christian princes of Europe, to offer them the Shah's friendship, chiefly with a view to some future common undertaking against the Turks, who were then the terror of Europe.

Between Persia and Turkey hostilities were still carried on. Nuhavend, Tebriz, and Bagdad were taken; a Turkish army of 100,000 men was defeated by about half that number of Persians; Abbas recovered Azerbijan, Shirwan, part of Georgia, and Armenia, and subsequently also Kurdistan, Mosul, and Diarbekir; and the Turks were ever after this victory kept in check. They formed a league with the Tartars of Kaptchak, but the united forces of both were vanquished in a battle fought between Sultanieh and Tebriz, A. D. 1618, the last memorable battle that occurred during the reign of Shah Abbas. Negotiations were then commenced between Abbas and the Sultan at Constantinople; but insurrections and conflicts in the frontier provinces, fomented and secretly instigated by the Turkish government, still continued for some time.

Shah Abbas encouraged the trade of Europeans with Persia: he protected the factories which the English, the French and the Dutch had at Gombroon; but he looked with jealousy on the flourishing establishment of the Portuguese on the small island of Ormuz, situated near the entrance of the Persian Gulf, which had been in their possession ever since 1507, when Albuquerque occupied it, and had now become the emporium of an extensive commerce with India, Persia, Arabia, and Turkey. This settlement the Persians and the English East India Company agreed to attack with joint forces. The English furnished the naval, the Persians the military, forces; and the island was taken on the 22nd April, 1622. For this service the English received part of the plunder, and a grant of half the customs at the port of Gombroon; but their hopes of further advantages for their commerce in these parts were frustrated, and the mission of Sir Dodmore Cotton from England to the Persian court, in 1627, likewise failed in procuring them.

After a reign of upwards of forty years, Shah Abbas died at Kaswin, A. D. 1628. Like most of the monarchs of the Sufi dynasty, he was excessively cruel, and hasty in awarding capital punishment often on very slight grounds. All his sons fell victims to his suspicion and jealousy; only one grandson survived him, who succeeded him on the throne as Shah Sufi. Abbas was a zealous Shiite, and used to make frequent pilgrimages to the tomb of Imam Ali Reza, at Meshhed; but he showed great tolerance to those that professed other religions, and especially to Christians. His belief in astrology was so firm that he once even vacated the throne for a short period during which it had been predicted that danger menaced the life of the Shah. He made Isfahan the capital of the empire, and embellished that town by magnificent gardens and palaces. He favoured commerce, and rendered the communications in the interior easier by caravanserais and highways. As a means of securing the authority of the crown, he countenanced the conflict of political parties in the interior; with the same view he formed a new clan of his own, consisting of persons from all classes, and denominated the 'King's friends,' whom he distinguished and attached to his person by many particular favours.

ABBASIDES. The name of this family of sovereigns is derived from their ancestor, Abbas ben Abd-al-Motalleb, a paternal uncle of the Arabian prophet Mohammed. On account of their descent from so near a relation of the prophet, the Abbasides had, ever since the introduction of the Islam, been held in very high esteem among the Arabs, and had at an early period begun to excite the jealousy of the Ommaïade caliphs, who, after the defeat of Ali ben Ali Taleb, the son-in-law of Mohammed (A. D. 661), occupied the throne of the Arabian empire. The Abbasides had already for some time asserted their claims to the caliphat, in preference to the reigning family, when, in A.D. 746, they formed a strong party, and commenced open hostilities against the government of the Ommaïades in the province of Khorasan. Three years afterwards (A.D. 749) the Abbaside Abul-Abbas Abdallah ben Mohammed, surnamed Al-Saffah, or 'the bloodshedder,' was recognized as caliph at Kufa. A battle on the banks of the river Zab, not far from Mosul (in the same neighbourhood where, more than a thousand years before, the battle of Gaugamela had made Alexander master of the Persian empire), decided (Jan. 750 A. D.) the ruin of the Ommaïades. Merwan II., the last caliph of that lineage, fled before the advancing forces of Al-Saffah from Mosul to Emesa, thence to Damascus, and finally to Egypt, where he was overtaken and killed. So great was the hatred of the victorious party against the vanquished royal family, that not less than ninety Ommaïades were doomed to a cruel and ignominious death, while even the remains of those that were already dead, were taken out of their tombs, and publicly insulted. A survivor of the fallen dynasty, Abd-alrahman, a grandson of the caliph Hesham, escaped to Spain, the westernmost province of the Arabian empire. There his name procured him a favourable reception; he was saluted as king, and an Ommaïade lineage continued to reign for nearly three centuries (A.D. 756—1031) over the eight Mohammedan provinces of Spain.

Al-Saffah died in A.D. 753, and was succeeded in the caliphat by his brother Al-Mansur (A.D. 753—774), who removed the seat of government from Damascus to the new-built city of Bagdad. He was successful in wars with the Turcomans and with the Grecian empire in Asia Minor: but the internal tranquillity of his reign was often disturbed by insurrections in the distant provinces. In the reign of his son, Mohdi (A.D. 774—784), a Mohammedan army, under the command of the youthful Harun al Rashid, penetrated the Grecian provinces of Lesser Asia as far as the Hellespont. During the short reign of Mohdi's son, Hadi (784—786), an attempt at an overthrow of the Abbaside dominion was made at Medina, by Hossein, a descendant of Ali ben Abi Taleb.

Hadi was followed by the celebrated Harun al Rashid, a grandson of Al-Mansur, whose early military exploits have already been alluded to. When called to the throne, he soon displayed a love of justice and peace, and a zeal for literature and the arts, which corresponded to his valour as a military commander. He opened friendly communications with Charlemagne: the presents which he sent him (among others a curious sort of clock, a description of which is given by Eginhard), while they show the regard which he entertained for his great European contemporary, afford at the same time an illustration of the progress which the mechanical arts must at that time have made among the Arabs. In conducting the internal affairs of his empire, Harun was chiefly guided by his two ministers, Yahya and Jafar, of the ancient Persian family of the Barmekides, whose ancestors had, through many generations, previous to the introduction of the Islam, held the hereditary office of priests at the fire-temple of Balkh. But the high degree of popularity which the Barmekides enjoyed, aroused Harun's jealousy, and the rashness and cruelty with which he indulged himself in his suspicion by putting to death not only the two ministers, but almost all their relations, form an odious exception to the praise of mildness and equity with which his memory is honoured by Eastern chroniclers. The epoch of his reign has, in the remembrance of Mohammedan nations, become the golden age of their dominion. The wealth and the adopted luxury of the conquered nations had given to social life that refinement, and to the court of Bagdad that splendour, of which so lively pictures are exhibited in many of the tales of the *Arabian Nights*. Flourishing towns sprung up in every part of the empire. Traffic by land and by sea increased with the luxury of the wealthy classes; and Bagdad rivalled even Constantinople in magnificence.

To wage war against the Infidels was, with the Arabs, a matter of religion and of faith: as soon, therefore, as a conquered nation embraced the Mohammedan belief, it was no longer regarded as subject to the victors, but was raised to an equality with them, and formed an integral part of the same body. The different elements of the empire were thus held together by the tie of a common religion, and the language of the Koran (which the Mohammedans have always deemed it unlawful to profane by translations) became the medium of communication for the nations from the banks of the Indus to those of the Tagus and the Ebro. The supreme pontificate and the secular sovereignty, the two elements whose conflict forms the prominent feature in the history of the Christian world during the middle ages, were in the Mohammedan empire united in the person of the caliph, who, invested with the mantle, signet, and staff of the prophet, and bearing the title of Emir al Mumenin, *i.e.* Commander of the Faithful, wielded the supreme spiritual and temporal rule without any other restriction or control besides the ordinances of the established religion. The only formal recognition of the sovereignty of the caliphs (and, subsequently, of all other independent Mohammedan princes) was the prerogative of having the money of the state stamped with their name, and of having their name also introduced into the public prayers at the mosques. According to the ancient Persian plan, the several provinces of the empire were governed by delegates, with military and administrative powers. But this system soon proved fatal to the caliphat: for the lieutenants in the distant parts of the empire would often revolt, and aspire to independent authority. On an expedition to Khorasan, undertaken against such a disloyal satrap, Harun died at Tus, A.D. 808.

The throne was for some years contested between his two sons, Amin and Mamun: but, in A.D. 813, Mamun came to the sole and undisputed possession of it. His reign (A.D. 813—833) forms an important epoch in the history of science and literature, the cultivation of which was conspicuously patronized by that caliph. The Arabs were avowed borrowers in science: they were chiefly indebted to the Hindus and the Greeks; and even what they received from these nations seems often to have exceeded their comprehension. Their claims to originality of invention, and to the merit of having made real additions to the stock of knowledge, are not great; but they are entitled to *our* gratitude for having kept alive and diffused the light of letters, and for having preserved a sort of scientific tradition from classical antiquity, during an age when science and literature in Europe lay buried under ignorance and barbarism. Mamun founded colleges and libraries in the principal towns of his dominions, such as Bagdad, Bassora, Kufa, and Nishabur. Syrian physicians and Hindu mathematicians and astronomers lived at his court; and works on astronomy, mathematics, metaphysics, natural philosophy, and medicine were translated from the Sanscrit and Greek into Arabic. Mamun took personally a particular interest in astronomy. He built observatories, had accurate instruments constructed, improved by their means the astronomical tables, and caused a degree of the meridian to be measured in the sandy desert between Palmyra and Racca on the Euphrates. At his command, Mohammed ben Musa wrote an elementary treatise on algebra, the earliest systematic work extant on that branch of mathematics, for their knowledge of which, as well as for much of their astronomy, the Arabs seem to be chiefly indebted to the Hindus. The investigation of the structure of their own language, and the systematic development of the Mohammedan theology and jurisprudence, both founded chiefly on the Koran, afforded an opportunity of applying practically the principles of the Aristotelian philosophy.

The period of prosperity which the Arabic empire enjoyed under Harun al Rashid and Mamun was only of short duration. The chivalrous enthusiasm with which Mohammed had inspired his nation became soon extinguished under voluptuousness and love of enjoyment. Many provinces in the west (Spain, Fez, and Tunis) had already shaken off their allegiance to the caliphat, and the attachment of others in the east was likewise doubtful. From the north the empire was threatened by the Turks, some tribes of whom had been compelled to adopt the Mohammedan religion. Turkish youths were soon brought as mercenaries to Bagdad, and Motasem (833—842), the brother and successor of Mamun, formed of them a body-guard, which, under the reign of Vathek (842—846), Motawakkel (846—861), and Montaser (861, 862), became to the caliphat what the prætorian guards had been under the Roman emperors. Mostaïn (862—866) was obliged to concede to them the privilege of electing their own commander, and thus lost much of his authority at home, while the provinces of his empire were infested by invasions from the Greeks. Under his successor Motaz (866—868), a native of Sejestan, Yakub al Laith, surnamed Al-Soffar, *i.e.* the brazier, made himself master of Khorasan, Kerman, Persia proper, and Khuzistan, and united these provinces into an independent kingdom, with Nishabur for its capital, which continued in the possession of his family (the Soffarides) till 917.

The successors of Motaz were Mohtadi (868, 869), Motamed (869 — 892), Motadhed (892 — 902), Moktafi (902 — 907), Moktader (907 — 932), and Kahir (932 — 934). Under the reign of Radhi (934—940) the disorder of the empire had reached such a height, that the caliph, in order to restore public order and tranquillity, was obliged to call Mohammed ben Rayek, the governor of Wasith, to Bagdad, and to confide to him, with the title of Emir al Omara, or commander of the commanders, an almost unlimited authority in the government. From this time the caliphat became a mere nominal dignity; all the efficient power was in the hands of the mighty Emirs al Omara, After the short reign of Mottaki (940—943), Mostakfi (943, 944) came to the caliphat; but he was soon dethroned by Moizzeddaula the Buide (properly Bawaihide), who, in concert with his two brothers, had rendered himself master of a great part of Persia and Irak. Moizzeddaula conferred the caliphat, now limited to the mere pontifical dignity and to the possession of the town of Bagdad, on Mothi Lillah (946—973), and reserved to himself the powerful office of Emir al Omara, which continued hereditary in his family during the caliphat of Tayi lillah (973—991), and Kadir billah (991—1031), till the year 1056, when, in the caliphat of Kaïm biamr illah (1031—1074), Bagdad was occupied by the Seljukes under Togrul Beg, whose family retained the authority of Emir al Omara till 1152, while the nominal sovereignty of the caliphat passed from Kaïm biamr illah successively into the hands of Moktadi (1074—1094), Mostajer (1094—1118), Mostarshed (1118—1134), Rashid (1134, 1135); and Moktafi (1135—1160). The sovereigns of those principalities into which the Arabian empire had now dissolved itself, either still recognized the caliph at Bagdad as Imam or supreme pontiff, and thus showed him a sort of spiritual allegiance, or they were Shiites, *i.e.* partizans of the cause of Ali ben Abi Taleb and his descendants, and as such execrated the dominion of the Abbasides. Of the first kind were the Tulunides and Ikshides in Egypt and Syria, and the Tahirides, Soffarides, Samanides, and Gasnevides in Persia and Khorasan; to the second description belonged the Assassines, and the Fatimides in Africa. Moktafi's son Mostanjed (1160—1170) was succeeded in the caliphat by Mostadhi (1170—1179), and Nasir (1179—1226), during whose reign the Tartars under Jingiskhan invaded Persia. Dahir occupied the caliphat only for a few months. His successor, Mostanser (1226—1242), offered for a time a vigorous resistance to the advance of the Tartar conquest; but his son Mostasem was defeated and killed by the Tartar Hulaku, who took Bagdad, and put an end to the government of the Abbasides.

Ahmed, a son of the caliph Dahir, fled to Egypt, where Sultan Bibars, the Mamluk (A.D. 1260), recognized him as caliph. But he soon met his death at Bagdad in an attempt to establish his right to the throne of his ancestors; and Bibars conferred the title of caliph on another Abbaside, Hakem bi-amillah, whose descendants, under the protection of the Mamluks, retained possession of the almost nominal caliphat in Egypt till 1517, when the Osman Turks conquered Egypt. Sultan Selim took the last Abbaside caliph, Motawakkel, to Constantinople, where he kept him for some time as a prisoner, but afterwards allowed him to return to Egypt, where he lived at Kairo till his death, in 1538.

ABBE' is the French term for Abbot, which will be explained in its place. In France, before the Revolution, Abbé was the denomination of a very numerous body of persons, who had little or no connexion with the church, except the apparent one, which they derived from this title. Many of them had not even received the tonsure, which, is in Roman Catholic countries, the first and indispensable mark of the clerical character. So far back as the end of the seventeenth century, we find Richelet, the lexicographer, complaining that there was scarcely a young man, tolerably well made, and who had acquired the air of an ecclesiastic, who did not, by an insufferable abuse, assume the style of Monsieur l'Abbé. 'People,' he adds, 'even stupidly honour with that respectable name any scholar living, who may have put on the short coat, the small neckband, and the little peruke.' Another author, Mercier, writing a century later, describes the same class of characters. 'They are persons,' he says, 'passing under the denomination of Abbé, without any clerical mark or ornament, in a smart coat with gilt buttons, a small opera hat, displaying a high style of frisure of the hair, and the most effeminate manners.' The coat, usually of brown or blue, with the neckband and wig, formed the well-known distinguishing costume of the Abbé. The band, descending under the chin, was originally the common dress of all classes: ecclesiastical persons only wore it shorter than others, in affectation of humility. As for the peruke, which was also of small dimensions, it is said to have been first worn by the Abbés about the year 1660; the Abbé Lariviere, a worthless character, who afterwards became Bishop of Langres, having set the example. This innovation greatly scandalized the more serious members of the ecclesiastical order; and several works were written in vehement condemnation of the abuse. One of these bears the odd title of *Clericus Deperrucatus*, which may be translated *The Church Unperiwigged.* The abbés occupied a very conspicuous place in French society, and discharged a variety of functions. 'In man houses,' writes Mercier, 'we find an Abbé, on whom is bestowed the appellation of friend, and who is in reality but an honest upper servant, commanding the livery servants: he is the humble attendant on Madame, assisting at her toilet, taking charge of household matters in general, and directing the affairs of Monsieur without.' Many of the abbés, however, followed a more useful and creditable way of life. Some acted as private tutors in families, though these were seldom treated with much respect, and were consequently, in general, persons of very inferior qualifications. Others were professors of the university; and a great many employed themselves as men of letters,—in which capacity their labours have given to the title of Abbé an honourable celebrity, and redeemed it from the universal contempt to which swarms of frivolous and intriguing sycophants would otherwise have reduced it.

ABBE'S COMMENDATAIRES, were such abbés as held abbeys in commendam,—that is, with the right of administering their revenues, or a part of them. There were, before the Revolution, between 200 and 300 abbeys in France, which the king had the privilege of conferring in commendam; and it was the expectation of obtaining one of these benefices which induced so many persons to take the title of Abbé. Before obtaining such preferment they used to be called *Abbés de sainte esperance*, abbés of holy hope. After they were thus provided for, they were Abbés Commendataires. The papal bull, which ratified their appointment, commanded them in all cases to get themselves ordained priests within the year, or as soon as they should arrive at the canonical age (five-and-twenty), on pain of the benefice being declared vacant; but it was common to obtain dispensations for disregarding this condition, and most of them remained Secular Abbés, as they were designated; that is, not subjected to any monastic rule. The Abbé Commendataire received the third part of the revenues of his abbey, and also enjoyed certain dignities and privileges which it is unnecessary to specify; but the actual government of the house was committed to the hands of a resident superior, the *prieur claustral*, who was in almost all respects quite independent of the sinecurist, his colleague.

ABBESS, the superior of a nunnery, or other female religious community. An abbess, in the Roman Catholic Church, possesses, in general, the same dignity and authority as an abbot, except that she cannot exercise the spiritual functions appertaining to the priesthood. An abbess, for example,

Costume of an English Abbess
(From Strutt's Ecclesiastical Antiquities).

cannot confess her nuns; although it appears that in ancient times she was allowed to do so; and that the practice was suppressed, according to the learned father Dom Martene, in his treatise on the *Rites of the Church*, in consequence of its having been found that there was no end to the questions which female curiosity would ask. According to a decree of the Council of Trent, an abbess, at the time of her election, ought to be at least forty years old, and to have made profession for eight years; and it is forbidden that any person be elected to the dignity who has not been professed for five years, or is under thirty years of age.

ABBEVILLE, a town in France, in the department of the Somme, and upon the river which gives name to the department. It is situated in a pleasant and fertile valley, and is a place of considerable trade. Its manufactures are various, and include woollen stuffs, such as serges, barracans, &c.; also bed-ticking and linings; rope and twine; and soap. There is also a woollen-cloth manufactory, the most extensive in France, established in 1665, by Van Robais, a Dutchman, who was patronized by the minister Colbert. The cloths are little inferior to those of our own country. Dyeing and bleaching are also carried on. The articles thus made, together with the produce of the neighbourhood, grain, flax, hemp, and oil, constitute the chief exports of the place, which trades with Brittany and with Bayonne. The river at high water enables boats and vessels of one hundred tons to work up to the town. The population of Abbeville is about 19,000; but other accounts make it amount to 30,000, or even 36,000, including the suburbs. It is fortified, but is not to be regarded as in the first class of strong places. The houses are generally well-built, and of brick. A few are of stone, and some few ancient ones of wood. There were, before the revolution, many ecclesiastical establishments, including a collegiate church, and thirteen, if not fourteen, parish churches. Abbeville is twenty-five miles north-west of Amiens, the departmental capital, and ninety-one north by west of Paris. Lat. 50° 7′ north, and long. 1° 49′ east of Greenwich.

ABBEY, a religious community presided over by an abbot or abbess. When the superior was denominated a Prior, the establishment was called a priory; but there was latterly no real distinction between a priory and an abbey. The priories appear to have been all originally off-shoots from certain abbeys, to which they continued for some time to be regarded as subordinate. The wealthiest abbeys, in former times, were in Germany; and of all such foundations in the world, the most splendid and powerful was that of Fulda, or Fulden, situated near the town of the same name in Franconia. This monastery, which belonged to the order of St. Benedict, was founded by St. Boniface, in the year 784. Every candidate for admission into the princely brotherhood was required to prove his nobility. The monks themselves elected their abbot from their own number; and that dignitary became, by right of his office, Arch-Chancellor to the Empress, and Prince-Bishop of the diocese of Fulda. He claimed precedence over all the other abbots both of Germany and of France. One of the first effects of the Reformation, both in England and in Germany, was the destruction of the religious houses; although, even in the Protestant parts of the latter country, a few male and female monastic communities still subsist. In England their extinction was sweeping and complete. The preface to Bishop Tanner's *Notitia Monastica* may be consulted for the most accurate and comprehensive account that has been given of the number and revenues of the English monasteries at the time of the dissolution. From this statement, it appears that, by the Act of Parliament passed in 1535 for the suppression of all the establishments of this kind having a less revenue than 200*l*. a-year, about 380 houses were dissolved; from whose possessions the crown derived a revenue of 32,000*l*., besides plate and jewels to the value of about 100,000*l*. By a subsequent act passed in 1539, all the remaining monasteries were suppressed, to the number of 186; the revenues of these amounted to 100,000*l*. per annum. Besides the monasteries, forty-eight houses of the knight's hospitallers of St. John were also confiscated to the crown. Other authorities make the wealth of the monastic establishments much greater than it would appear to have been from this account; and it is probable that the revenues of many of them, at the period of the dissolution, had been considerably diminished by the precautions which the abbots were led to take in anticipation of that event. Camden states the whole number of the religious houses that were suppressed at 645. In the early times of the French monarchy, the term abbey was applied to a duchy or earldom, as well as to a religious establishment; and the dukes and counts called themselves abbots, although remaining, in all respects, secular persons. They took this title in consequence of the possessions of certain abbeys having been conferred upon them by the crown.

ABBOT, the title of the superior of certain establishments of religious persons of the male sex, thence called Abbeys. The word *Abbot*, or *Abbat*, as it has been sometimes written, comes from *Abbatis*, the genitive of *Abbas*, which is the Greek and Latin form of the Syriac *Abba*, of which the original is the Hebrew *Ab*, father. It is, therefore, merely an epithet of respect and reverence, and appears to have been at first applied to any member of the clerical order, just as the French Père and the English Father, having the same signification, still are in the Catholic Church. In the earliest age of monastic institutions, however, the monks were not even priests; they were merely holy persons who retired from the world to live in common, and the abbot was that one of their number whom they chose to preside over the association. In regard to general ecclesiastical discipline, all these communities were, at this time, subject to the bishop of the diocese, and even to the pastor of the parochial district, within the bounds of which they were established. At length it began to be usual for the Abbot, or, as he was called in the Greek Church, the Archimandrite (that is the Chief Monk), or the Hegumenos (that is the Leader), to be in orders; and since the sixth century monks generally have been priests. In point of dignity an abbot is considered to stand next to a bishop; but there have been many abbots in different countries who have claimed almost an equality in rank with the episcopal order. A minute and learned account of the different descriptions of abbots may be found in Du Cange's Glossary, and in Carpentier's Supplement to that work. In England, according to Coke, there used to be twenty-six abbots (Fuller says twenty-seven), and two priors, who were Lords of Parliament, and sat in the House of Peers. These, sometimes designated Sovereigns, or General Abbots, wore the mitre (though not exactly the same in fashion with that of the bishops), carried the crozier (but in their right hands, while the bishops carried their's in their left), and assumed the episcopal style of Lord. Some croziered abbots, again, were not mitred, and others who were mitred were not croziered. Abbots, who presided over establishments that had sent out several branches, were styled Cardinal-Abbots. There were

Costume of an English Mitred Abbot
(Principally from Dugdale's Monasticon).

likewise, in Germany, Prince-Abbots, as well as Prince-Bishops. In early times we read of Field-Abbots (in Latin, *Abbates Milites*) and Abbot-Counts (*Abba-Comites*, or *Abbi-Comites*). These were secular persons, upon whom the sovereign had bestowed certain abbeys, for which they were obliged to render military service as for common fiefs. A remnant of this practice appears to have subsisted in our own country long after it had been discontinued on the continent. Thus, in Scotland, James Stuart, the natural son of James V., more celebrated as the Regent Murray, was, at the time of the Reformation, Prior of St. Andrew's, although a secular person. And the secularization of some of the German ecclesiastic dignities has since occasioned something like a renewal of the ancient usage. We have in our day seen a prince of the House of Brunswick (the late Duke of York) at the same time Commander-in-Chief of the British army and Bishop of Osnaburg. The efforts of the abbots to throw off the authority of their diocesans long disturbed the church, and called forth severe denunciations from several of the early councils. Some abbeys, however, obtained special charters recognizing their independence; a boon which, although acquired at first with the consent of the bishop, was usually defended against his successors with the most jealous punctiliousness. Many of the abbots lived in the enjoyment of great power and state. In ancient times they possessed nearly absolute authority in their monasteries. 'Before the time of Charlemagne,' says Gibbon, 'the abbots indulged themselves in mutilating their monks, or putting out their eyes; a punishment much less cruel than the tremendous *vade in pace* (the subterraneous dungeon, or sepulchre), which was afterwards invented.' The picture which this writer draws of what he calls 'the abject slavery of the monastic discipline' is very striking. 'The actions of a monk, his words, and even his thoughts, were determined by an inflexible rule, or a capricious superior: the slightest offences were corrected by disgrace or confinement, extraordinary fasts, or bloody flagellation; and disobedience, murmur, or delay, were ranked in the catalogue of the most heinous sins.' The external pomp and splendour with which an abbot was in many cases surrounded, corresponded to the extensive authority which he enjoyed within his abbey, and throughout its domains. St. Bernard is thought to refer to the celebrated Luger, Abbot of St. Denis, in the beginning of the twelfth century, when he speaks, in one of his writings, of having seen an abbot at the head of more than 600 horsemen, who served him as a cortege. 'By the pomp which these dignitaries exhibit,' adds the Saint, 'you would take them, not for superiors of monasteries, but for the lords of castles,—not for the directors of consciences, but for the governors of provinces.' This illustrates a remark which Gibbon makes in one of nis notes:—'I have somewhere heard or read the frank confession of a Benedictine Abbot, "My vow of poverty has given me 100,000 crowns a-year, my vow of obedience has raised me to the rank of a sovereign prince."' Even in the unreformed parts of the continent, however, and long before the French Revolution, the powers of the heads of monasteries, as well as those of other ecclesiastical persons, had been reduced to comparatively narrow limits; and the sovereignty both of abbots and bishops had been subjected in all material points to the authority of the civil magistrate. The former became merely guardians of the rule of their order, and superintendents of the internal discipline which it prescribed. In France this salutary change was greatly facilitated by the concordat made by Francis I. with Pope Leo X., in 1516, which gave to the king the right of nominating the abbots of nearly every monastery in his dominions. The only exceptions were some of the principal and most ancient houses, which retained the privilege of electing their superiors. The title of Abbot has also been borne by the civil authorities in some places, especially among the Genoese, one of whose chief magistrates used to be called the Abbot of the People. Nor must we forget another application of the term which was once famous in our own and other countries. In many of the French towns there used, of old, to be annually elected from among the burgesses, by the magistrates, an Abbé de Liesse (in Latin, Abbas Lætitiæ), that is, an Abbot of Joy, who acted for the year as a sort of master of the revels, presiding over and directing all their public shows. Among the retainers of some great families in England was an officer of a similar description, styled the Abbot of Misrule; and in Scotland the Abbot of Unreason was, before the Reformation, a personage who acted a principal part in the diversions of the populace, and one of those whom the zeal of the reforming divines was most eager in proscribing.

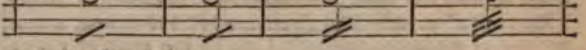
ABBOT, GEORGE, an English prelate of the seventeenth century, more remarkable for the circumstances of his personal history than on any other account. He was born in 1562, at Guilford, in Surrey, where his father was a poor clothworker. Aubrey, the antiquary, in the curious little volume which he published in 1696, under the title of *Miscellanies*, tells a marvellous story of a dream which the mother of George Abbot had, that he would become a great man. In spite of the dream the boy might have remained a clothworker, like his father, had there not been in those days many admirable public institutions for the education of the children of the humbler classes. George Abbot and his elder brother, Robert, were put to the grammar-school of their native town, and in due time proceeded to Baliol College, Oxford. George entered the University in 1578, and in 1597 obtained his first preferment by being elected Master of University College. After this he was also three times appointed Vice-Chancellor of the University. These academic honours seem to show that his reputation and influence at Oxford must have been considerable; but the high standing which he enjoyed has been attributed as much to the zeal with which he opposed Popery and Arminianism as to his superior ability or learning. There had already commenced between him and Laud that violent opposition of theological sentiment, which, involving them eventually in political hostility and in a contest of personal ambition, made them rivals and enemies for life. The Master of University College, however, must have been in considerable esteem for his erudition as well as for his orthodoxy, seeing that we find him in 1604 appointed one of the persons charged with the new translation of the Bible. He was one of eight to whom the whole of the New Testament, with the exception of the Epistles, was entrusted. In 1608 he was appointed chaplain in the establishment of the Earl of Dunbar, at this time the king's chief favourite. This connexion proved of the most important consequence to Abbot's future fortunes. Soon after it was formed, the earl was despatched to Scotland by the king, in order to commence that attempt to bring about a uniformity between the two national churches, their persevering prosecution of which so greatly contributed to the disastrous fate of the line of Stuart. Abbot accompanied him on this mission, and gave himself to its object with so much zeal as to secure the highest approbation and favour both from the earl and the monarch. His course of professional promotion, hitherto so slow, now proceeded with almost unexampled rapidity. He had in 1609 obtained the Deanery of Gloucester, and in December of that same year he was made Bishop of Lichfield and Coventry. In the February following he was transferred to the See of London; and, finally, in little more than a month afterwards, elevated to the Archbishopric of Canterbury. It is probable that Abbot was indebted for his elevation principally to his being the object at the moment of that capricious favoritism for which James was so remarkable throughout his reign. Abbot at this time did not disdain to court his royal master with the most profuse expenditure of that flattery which he loved so well to receive from others, and not unfrequently used to bestow on himself. Both Fuller and Clarendon have expressed a belief that, had the system of severity begun by Archbishops Whitgift and Bancroft not been interrupted by the intervention of the opposite politics of Abbot, Calvinism and dissent would have been extirpated from England, and the political convulsions which arose in the next reign, from the effervescence of these elements, would have been prevented. We do not think that this result would have followed; but, if it had, it is quite certain that the utter extinction of English liberty would have been its accompaniment. Abbot, however, although his theology was of a different complexion from that of his predecessor Bancroft, soon showed himself scarcely less inclined to stretch to their utmost extent all the powers and prerogatives of his office. In the Court of High Commission his conduct was as arbitrary and oppressive towards certain descriptions of delinquents as that of any one who had ever presided over that ecclesiastical tribunal; and he manifested the most marked disposition to set up its authority as superior to that of both the statute and the common law. It is also an accusation brought against him that, never having held a parochial charge himself, he was apt to be inattentive and overbearing towards the inferior or working clergy. In other respects, Archbishop Abbot, though a stern and rigid ruler of the establishment, was active and zealous in the performance of all the duties of his high station. After having reached the summit of professional advancement, he seems, like some other ambitious characters, Coke, for example, and Shaftesbury, to have exchanged the servility by which he rose for an opposite demeanour, and from the supple and cringing courtier to have sprung up into the bold advocate of popular rights and popular politics. Before obtaining the archiepiscopal dignity, Abbot had professed the doctrines of divine right and passive obedience in their most comprehensive and slavish form. Now, however, when circumstances placed him in opposition to the rising influence of his old adversary, Laud, he soon came to adopt and act upon principles in politics, as well as in religion, removed as far as possible from those of that headlong zealot of arbitrary power.

The bright fortunes of Abbot were, however, clouded by an occurrence of which his enemies took signal advantage. On the 24th of July, 1622, the Archbishop (prelates then did not think it unbecoming their office to engage in secular sports) was occupied in a stag hunt in Lord Zouch's park at Harringworth, in Hampshire, where he was so unfortunate as to discharge, while he sat on horseback, a barbed arrow from his cross-bow, which struck one of the park-keepers, Peter Hawkins, in the fleshy part of the left arm, and occasioned the man's death in less than an hour. The party in the church and state to whom Abbot was opposed, employed every effort to turn this accident to his disadvantage, both with the public and with the king; and although James very sensibly remarked that 'an angel might have miscarried in this sort,' he found it necessary to yield so far to the clamour that was raised, as to appoint a commission to consider the case of the archbishop, and to determine whether he had not, by this act of chance-medley, incapacited himself, as Laud and his partizans asserted, for discharging the duties of his office. The adjudication of the commissioners was, that nothing more than an irregularity had been committed, but that it would be necessary for the archbishop to receive the king's pardon, and also a dispensation, before he could resume the exercise of his functions. These forms were accordingly gone through; but the affair, although thus far satisfactorily terminated, gave great vexation and distress to Abbot, both from the scandal to which it subjected him, and from the feelings with which he naturally and unavoidably contemplated the lamentable event of which he had been, though unintentionally, the cause. It is said that, throughout the remainder of his life, he observed a monthly fast on the day of the week which had thus stained his hand with blood; and he also settled a pension of twenty pounds for life on Hawkins's widow. After this he withdrew for some time from his attendance at the Council Board, and took no part in public affairs. The following year, however, on hearing it reported that the king intended to proclaim a toleration to the Papists, he wrote a letter to his Majesty, dissuading him from that measure. He also, soon after this, strenuously opposed in Parliament the projected match between the Prince of Wales and the Infanta of Spain. On the 2nd of February, 1626, Abbot crowned Charles I. in Westminster Abbey, Laud officiating as Dean of Westminster. The new reign confirmed the ascendancy of this latter personage and his confederate Buckingham, and left the Archbishop and his politics less influence at Court than ever. In these circumstances he selected and steadily persevered in that independent path in which alone he was now to find either honour or safety. In 1627, when Dr. Manwaring was brought to the bar of the House of Lords, and sentenced to be fined, admonished, suspended, and imprisoned, for a sermon in which he asserted that 'the king is not bound to observe the laws of the realm concerning the subjects' rights and liberties, but that his royal will and command in imposing loans and taxes, without common consent in Parliament, doth oblige the subjects' conscience upon pain of eternal damnation,' Abbot, in reprimanding the culprit, by order of the House, expressed in energetic terms his abhorrence of so audacious a doctrine. He also refused to license another discourse of a similar description, which had been preached at Northampton by Dr. Sibthorp, and for this he was suspended from his archiepiscopal functions, and ordered into confinement in one of his country houses. This most arbitrary and oppressive treatment was *mainly* the work of his vindictive enemy Laud, whose character, accordingly, the archbishop has delineated with a pen dipped in gall, in a narrative of the affair which he drew up in his own vindication, and which Rushworth has printed. It was found necessary, however, soon after, to restore him to favour, and he received his summons as usual to the Parliament which assembled in March, 1628. During the rest of his life he continued the same course of opposition to the arbitrary and oppressive measures of the Court; and by the resistance which he offered, as far as lay in his power, to the insane counsels of Laud, may be said to have established a claim to be regarded as a patriot in the termination of his career. He died at his palace of Croydon on Sunday, the 4th of August, 1633, and was buried in the church of his native town of Guilford, where a sumptuous monument is erected to his memory. He was the founder of a well-endowed hospital, which still exists in that town; and other instances are recorded of his charity and munificence. He was succeeded in the primacy by Laud, who soon brought matters to such a pass as overthrew both himself and the church.

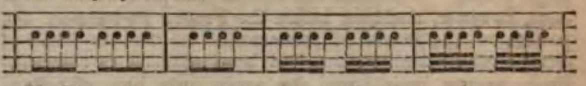
Archbishop Abbot is the author of several literary productions, among which is *A Brief Description of the whole World*, published in 1636. His brother Robert was raised to the see of Salisbury in 1615, but died on the 2nd of March, 1618. The archbishop's youngest brother, Maurice Abbot, was an eminent London merchant, and was, in the course of his life, one of the first Directors of the East India Company, Lord Mayor, and representative of the City in Parliament. He died in 1640. The sons of the poor cloth-worker were thus singularly lucky in their worldly advancement.—[See *Biographia Britannica*—*Wood's Athenæ Oxonienses*, by Bliss—*Fuller's English Worthies*—*Bayle's Dictionnaire Critique*—*Rushworth's Collection*—*Southey's Book of the Church*.]

ABBREVIATION, a mathematical term, given to the process by which a fraction is reduced to lower terms. Thus the division of the numerator and denominator of $\frac{16}{24}$ by 8, which reduces it to $\frac{2}{3}$, *abbreviates* the fraction.

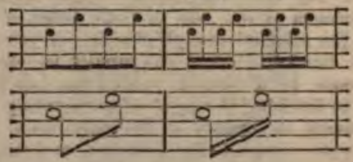
ABBREVIATION (*in Music*) is a kind of stenography, or short-hand, which much diminishes the labour of the composer and copyist, and ought to be well understood by every performer. It not only frequently happens that the same note is reiterated, but the same passage is repeated, and the necessity of writing at length such repetitions is avoided by the use of certain well-contrived, simple abbrevitions. Those most commonly employed are:—I. One dash, or more, through the stem of a minim or crotchet, or under a semibreve, by which such note is converted into as many quavers, semiquavers, &c., as it is equal to in time. Ex.



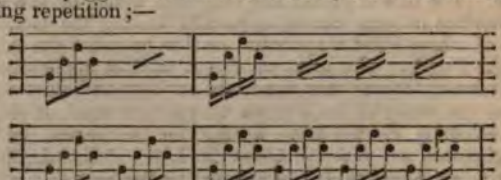
are to be played thus,—



II. Two alternate notes frequently repeated, are commonly abridged in the following manner,—



III. Arpeggios are thus contracted, the dash alone denoting repetition;—



IV. The word *simili* (*the same*) signifies that the group of notes is to be repeated. *Bis* (*twice*) written over a bar, or a passage, denotes repetition. The abbreviations of Italian or other terms used in music, will be found under the respective words.

ABBREVIATIONS, the shortening of a word or phrase, made either by omitting some letters or words, or by substituting some arbitrary mark.

Abbreviations are of two kinds; first, those which are used in familiar speech, by which two words are made one, as can't for can not, won't for will not, &c., and those which are employed in writing only; our business is with the latter.

Before the invention of printing, every expedient to abridge the enormous labour of copying would be naturally adopted, and the principle, once introduced, was followed where the necessity which led to its first employment no longer existed. Latin inscriptions are not unfrequently quite unintelligible to the best scholar who has not given the subject his particular attention, and many are ambiguous even to the most skilful. The most usual Latin abbreviation is the initial letter instead of the whole word; whether a name, as M. for Marcus, P. for Publius; or a relation, as F. for filius, a son; or an officer, as C. for consul, Qu. for quæstor, &c.

The Rabbins carried this practice to a great extent; and although, in copying the Bible, they carefully abstained from abbreviations, their other writings are filled with them. They even carried their abbreviations into their common tongue, and when they had contracted a name or sentence, by taking the initials only, they made words of the unconnected letters by the interposition of vowels. Thus, for Rabbi Levi ben Gerson, they took the first letters, R.L.B.G.; and, by the interposition of vowels, made the word Ralbag.

In the middle ages the practice of abbreviating increased; and even in printing, where the employment of contractions was much less necessary, the old mode was by no means abandoned. Many writings became unintelligible; and in matters of law and government the difficulties thus created demanded the interposition of Government. An Act of Parliament was passed in the fourth year of George II., by which the use of abbreviations was altogether forbidden in legal documents; and although this was so far modified by another Act, within a year or two, allowing the use of those of common occurrence, the old practice was never completely revived. A few only are still employed, chiefly in titles, coins, and commercial transactions; the most important of which follow,—

TITLES.

A.M. Master of Arts.
Abp. Archbishop.
Bp. Bishop.
Bt. Baronet.
B.A. Bachelor of Arts.
B.C.L. Bachelor of Civil Law.
B.D. Bachelor of Divinity.
Clk. Clerk, a Clergyman.
C.B. Companion of the Bath.
Dr. Doctor.
D.C.L. Doctor of Civil Law.
D.D. Doctor of Divinity.
Mus. D. Doctor of Music.
Esq. Esquire.
F.G.S. Fellow of the Geological Society.
F.L.S. Fellow of the Linnæan Society.
F.R.S. Fellow of the Royal Society.
F.S.A. Fellow of the Society of Antiquaries.
G.C.B. Grand Cross of the Bath.
G.C.H. Grand Cross of Hanover.
J.V.D. Of Canon and Civil Law.
Kt. Knight.
K.B. Knight of the Bath.
K.C.B. Knight Commander of the Bath.
K.C.H. Knight Commander of Hanover.
K.G. Knight of the Garter.
K.G.H. Knight of Guelph of Hanover.
K.M. Knight of Malta.
K.P. Knight of St. Patrick.
K.T. Knight of the Thistle.
Lp. Lordship.
LL.D. Doctor of Law.
Mr. Mister.
Mrs. Mistress.
Messrs. Gentlemen.
M.A. Master of Arts.
M.D. Doctor of Physic.
M.P. Member of Parliament.
M.R.I.A. Member of the Royal Irish Academy.
R.A. Royal Academician.
Rt. Hon. Right Honorable.
R.E. Royal Engineers.
R.M. Royal Marines.
R.N. Royal Navy.
S.T.P. Doctor of Divinity.
U.E.I.C. United East India Company.
W.S. Writer to the Signet.

ON ENGLISH COINS.

A.C. Arch-Chancellor.
A.D. Arch-Duke.
A.T. Arch-Treasurer.
B. et L.D. Duke of Brunswick and Lunenberg.
D.G. By the Grace of God.
F.D. Defender of the Faith.
S.R.I. Holy Roman Empire.
M.B.F. et H. Great Britain, France, and Ireland.
R. King.

COMMERCIAL.

Cr. Creditor.
Dr. Debtor.
Do. or ditto, the same.
No. Number
Fo. Folio.
4to. Quarto.
8vo. Octavo.
Ro. Right-hand page.
Vo. Left-hand page.
L.S.D. Pounds, Shillings, and Pence.
A.R.P. Acres, Roods, and Poles.
Cwt. Qr. Lb. Oz. Hundredweights, Quarters, Pounds, and Ounces.

MISCELLANEOUS.

A.D. the year of our Lord.
A.H. the year of the Hegira.
A.M. the year of the world.
A.M. before noon.
A.U.C. the year of the building of Rome.
B.C. Before Christ.
i.e. that is to say.
ib. in the same place.
id. the same.
H.M.S. His Majesty's ship
L.S. the place of the Seal.
MS. Manuscript.
N.B. Observe.
N.S. New Style (after the year 1752).
O.S. Old Style (before 1752).
Nem. con. without contradiction.
Nem. dis. unanimous.
P.M. Afternoon
P.S. Postscript.
ss. a half
ult. the last month.
viz. namely.
U.S. United States.
Xmas. Christmas.
Xtian. Christian.

ABDALLATIF, or, with his full name, MOWAFFIKEDDIN ABU MOHAMMED ALLATIF BEN YUSSUF BEN MOHAMMED BEN ALI BEN ABI SAID, a distinguished Arabic writer, whose name has become familiar to us chiefly through an excellent description of Egypt, of which he is the author. The Baron Silvestre de Sacy has appended to his French translation of this treatise a notice of the life of Abdallatif, taken from the bibliographical work of Ebn Abi Osaibia, who knew Abdallatif personally, and to a great extent quotes an account of his life written by himself.

We learn from this notice that Abdallatif was born at Bagdad in A.H. 557 (A.D. 1161). From his earliest years he received a lettered education. Agreeably to the prevailing fashion of his age and country, which considered a thorough familiarity with the copious and classical Arabic language as the indispensable groundwork for every liberal acquirement, he was led to commit to memory the Koran, the much-admired Makamat, or novels of Hariri, and other compositions distinguished for the purity and elegance of their diction, besides several works professedly treating on style or grammar. Next to these philological studies, he had already bestowed some attention on Mussulman jurisprudence, when the arrival at Bagdad of Ebn al Tateli, a naturalist from the western provinces of the Arabian empire, attracted his curiosity towards natural philosophy and alchemy, of the illusory nature of which latter pursuit he seems not till late, and after much waste of time and labour, to have convinced himself.

Damascus, the residence of Saladin, had about this time, through the liberality of that celebrated sultan, become a rallying point for learned men from all parts of the Mohammedan dominions. It is here that we and Abdallatif commencing his literary career by the publication of several works, mostly on Arabic philology. But the celebrity of several scholars then residing in Egypt, among others the Rabbi Moses Maimonides, drew him to that country to seek their personal acquaintance. A letter from Fadhel, the vizir of Saladin, introduced him at Kairo, and he was delivering lectures there while Saladin was engaged with the crusaders at Acca (St. Jean d'Acre). Soon, however, the news of Saladin's truce with the Franks (A.D. 1192) induced Abdallatif to return to Syria, and he obtained from Saladin a lucrative appointment at the principal mosque of Damascus. After the death of Saladin, which took place in the next year, we find Abdallatif going back to Kairo, where he lectured on medicine and other sciences, supported for a time by Al-Aziz, the son and successor of Saladin. It was during this residence at Kairo that Abdallatif wrote his work on Egypt. But the troubles of which Egypt now became the scene, induced Abdallatif to retire to Syria, and subsequently to Asia Minor, where he seems to have lived for a long time quietly at the court of a petty prince, Alaeddin Daud, of Arzenjan. After the death of that prince (A.D. 1227) he went to Aleppo, to lecture there partly on Arabic grammar, and partly on medicine and on the traditions, an important branch of Mohammedan theology and jurisprudence. Four years after this, Abdallatif set out on a pilgrimage to Mecca, and took his route through Bagdad, to present some of his works to the then reigning caliph Mostanser, when he died there, A.D. 1231.

Ebn Abi Osaibia has given a list of the works composed by Abdallatif, which, in the Arabic appendix to Baron de Sacy's translation, fills three closely-printed quarto pages. The description of Egypt, through which his name has become so familiar to all friends of antiquarian research in Europe, and in which he displays an accuracy of inquiry, and an unpretending simplicity of description almost approaching to the character of Herodotus, is dedicated to the caliph Nasir ledin-illah. It is divided into two books: the first treats, in six chapters, on Egypt generally, on its plants, its animals, its ancient monuments, peculiarities in the structure of Egyptian boats or vessels, and on the kind of food used by the inhabitants; the second book gives an account of the Nile, the causes of its rise, &c., and concludes with a history of Egypt during the dreadful famines of the years 1200 and 1201.

The only MS. copy of this work, of the existence of which we are aware, is preserved in the Bodleian Library at Oxford. From this MS. the Arabic text was edited for the first time at Tübingen, in 1787, by Paulus, and again, with a Latin translation, by the late Professor White, at Oxford, 1800, 4to. The French translation published by Baron de Sacy, under the title *Relation de l'Egypte*, &c. (Paris, 1810, 4to.)

beside its greater fidelity, has, through the copious notes added to it, become one of the most important works that the scholar can consult on the geography, the history, or the antiquities of Egypt.

ABDERA, a Greek town situated near the mouth of the Nestus (now the *Mesto*, or *Kara-sou*, i.e. *black-water*), in Thrace. It was originally founded by some Greeks of Clazomenæ, but owed its importance to a colony of Ionian Greeks from Teos, who left their native city (B.C. 557) when Cyrus had conquered Crœsus, king of Lydia, and was attacking the cities of Ionia. Xerxes passed through Abdera (B.C. 480) on his unsuccessful expedition against Greece. The people of Abdera had some of the Thracian tribes for their neighbours, who, we may conjecture, often rendered their situation uncomfortable and dangerous by their predatory incursions and insecure alliance. On one occasion they were rescued by Chabrias, the Athenian general, from the attacks of the Triballi.

Under the Romans, Abdera was a free city (Plin. iv. 11), which title marks a place of importance at that period. The epicure may be interested in learning that mullets were plentiful and good at Abdera. Its literary fame rests on the two names of Democritus and Protagoras.

Some geographers place Abdera east of the Nestus, but this is directly contrary to the testimony of Herodotus, who says that the river ran through the town. The exact site of this place is, we believe, unknown.

ABDICATION (from *Abdicatio*), in general is the act of renouncing and giving up an office by the voluntary act of the party who holds it. Though the expressions are frequently confounded, the word abdication differs from resignation in this, that the former signifies a total and unconditional renunciation of an office; whereas by the latter term is meant a relinquishing in favour of another. As to the cases in which an abdication will be presumed, from actions inconsistent with and subversive of the essential nature and object of the office held, see Blackstone's *Commentaries*, vol. i. p. 210-212, and iv. p. 78, where mention is made of the resolution of the legislature, in 1688, that King James II. had, by acts subversive of the constitution of the kingdom, by breaking the original contract between king and people, virtually renounced the authority which he claimed by that very constitution, and that, therefore, the throne had become vacant. It appears, by the parliamentary debates at that period, that in the conference between the two Houses of Parliament, previous to the passing of the statute which settled the crown upon William III., it was disputed whether the word 'abdicated,' or 'deserted,' should be the term used, to denote in the Journals the conduct of James II. in quitting the country. It was then resolved that the word 'abdicate' should be used, as including in it the mal-administration of his government.

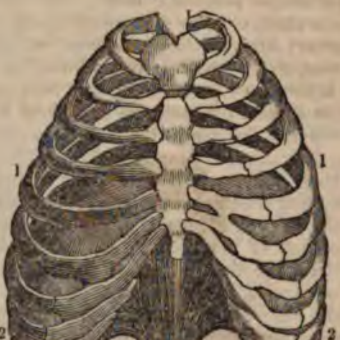
ABDOMEN; the Belly, from *Abdo*, to hide, because it conceals or hides its contents. The last syllable is only a termination. The *lower belly*, Imus Venter, Alvus, Gaster, &c. &c., are synonymous.

The human body is divided by anatomists into three portions, the head, the trunk, and the extremities. The head and trunk enclose cavities which contain the organs or the instruments by which the most important functions of the living body are performed. The trunk forms two cavities, the superior of which is termed the Thorax or Chest, and the lower constitutes the Abdomen.

In the artificial skeleton nothing is shown, because nothing remains, except the mere framework of the body or the bones; but in the natural state, when the soft parts remain as well as the bones, there is a complete partition between the cavity of the chest and that of the abdomen (*fig.* I. 1, 2.) This partition is effected by means of an organ which is termed the Diaphragm (*fig.* I. 1, 2.), a name derived from a Greek word signifying to divide. The Diaphragm is composed partly of membrane, but chiefly of muscle. It is placed transversely across the trunk at about its middle portion, dividing it into two pretty nearly equal halves (*fig.* I. 1, 2.). But the Diaphragm is a moveable body; it is in fact one of the main organs of respiration; its chief function consists in alternately increasing and diminishing the capacity of the thorax and abdomen; for a purpose in the animal economy which will be fully explained hereafter. [See Respiration.] But since the very partition which separates these two cavities from each other is perpetually changing its relative position, now encroaching upon the one, and now upon the other, it is obvious that their actual capacity must be constantly varying.

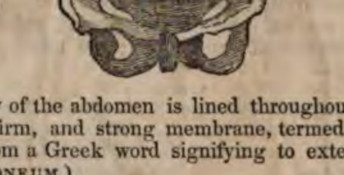
The cavity of the Abdomen is bounded above by the Diaphragm (*fig.* I. 3.), below by the bones of the Pelvis or Basin (*fig.* I. 3, 3, 3, 3.), which may be considered as belonging to the bones of the lower extremities, before and at the sides by the abdominal muscles, behind partly by the muscles of the loins, and partly by the bone of the spine. The spine, as will be shown hereafter, (See Spinal Column,) is composed of a number of separate bones, each of which is termed a vertebra. The vertebræ are firmly united together, and by their union form what is commonly called the back-bone, termed by anatomists the spinal or the vertebral column.

Fig. I.



The cavity of the abdomen is lined throughout by a thin, but dense, firm, and strong membrane, termed the Peritoneum, from a Greek word signifying to extend around. (See Peritoneum.)

Fig. II.



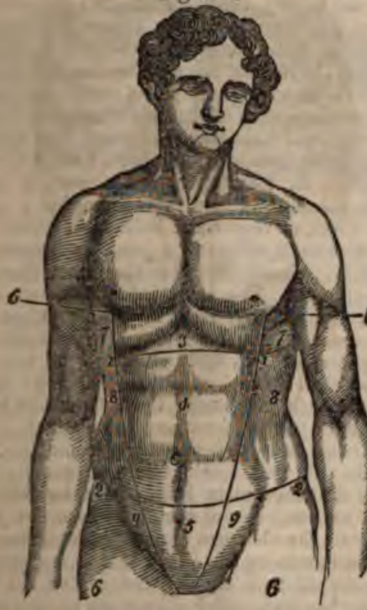
Diaphragm removed from its natural situation between the Chest and Abdomen.

We have spoken of the abdomen as a cavity, but without explanation, this mode of expression may occasion misconception. During the state of life there is no cavity. The abdomen is always completely full. It has been stated that the diaphragm alternately enlarges and diminishes the space proper to the abdomen; but the abdominal and lumbar muscles which form so large a part of the boundaries of the abdomen in front, at the sides and behind, in like manner alternately contract and relax. The consequence is, that a firm and uniform pressure is at all times maintained upon the whole contents of the abdomen, so that there is always the most exact adaptation of the containing to the contained parts, and of the viscera one to the other, not the slightest space or cavity ever intervening either between the walls of the abdomen and its viscera, or between one viscus and another. By the cavity of the abdomen, therefore, is not meant what the expression might at first view seem to denote, namely, a void or empty space; but the term is merely employed to mark the extent of the boundary within which the abdominal viscera are enclosed.

When the number, the diversity, the proximity, the relation, and the importance of the organs contained within the abdomen is considered, it will be obvious that it must be a matter of absolute necessity to the anatomist, the physiologist, the physician, and the surgeon, to mark with accuracy the situation of each. An effectual expedient for the accomplishment of this object is now in universal use. It consists in dividing the whole extent of the abdomen into certain parts or regions. It must be borne in mind that this division is altogether arbitrary, and is adopted not because there is any such division in nature, but solely because it is convenient for the purposes of science. The abdomen, then, is artificially mapped out into the following regions.

Two imaginary lines are drawn across the abdomen, one of which is supposed to extend from about the seventh rib on one side to the same point on the opposite side (*fig.* III. 1. 1.). The second line is supposed to extend from the fore part of the large bone of the pelvis to the same projecting point on the other side (2. 2.). These lines mark out three large and distinct spaces (3, 4, 5.). The space above the upper line is termed the Epigastric Region (3.). The space below the lower line is termed the Hypogastric Region (5.). The space included between the two lines is termed the Umbilical Region (4.).

Fig. III.



Two lines are next supposed to extend vertically, one on each side from between the seventh rib to the prominence formed by the large bone of the pelvis (*fig.* III. 6. 6.). By these vertical lines the three first regions are still further subdivided in the following manner:—The right and left parts of the Epigastric region form two distinct regions (7. 7.); these are termed the right and left Hypochondriac (7. 7.), while the central part retains the name of the Epigastric (3.). In like manner the right and left parts of the umbilical region form two distinct regions (8, 8.), which are termed the Lumbar Regions (8, 8.), while the central part retains the name of the Umbilical (4.). Moreover, the right and left parts of the hypogastric regions are at the same time each divided into two, which are termed the Iliac Regions (9, 9.), while the central part is termed the Region of the Pubis (5.).

This arrangement being once understood, it is easy to speak with precision of the situation of any of the abdominal viscera. He who has made himself thoroughly acquainted with these regions, and with the organs situated in each, can tell what viscera would be wounded supposing a sharp instrument were to pass from the fore to the back part of the body, entering at any given point of the abdomen. He who can tell this has acquired, in a practical point of view, an invaluable piece of information. He who cannot tell this is in danger, in the practice either of medicine or surgery, of committing perpetual and fatal mistakes; and, therefore, until he can tell this, no student of medicine who has a clear conception of the duties of his profession, and who wishes to perform these duties conscientiously, can be at rest.

Knowledge of structure is necessary to the knowledge of function; knowledge of natural function is necessary to the knowledge of diseased function; knowledge of the nature of disease is necessary to the cure of disease. The natural situation and relation of organs, the healthy structure of organs, the sound action of organs, must therefore form the subject of the daily study of the physician and surgeon, since this knowledge is the basis of the science of the one and the art of the other. Now, among the means of acquiring this knowledge, one of the most direct and certain is the examination of the external parts of the body. There are organs, indeed, placed beyond the reach of any external examination. The disordered states of such organs can be ascertained only by symptoms. The diseases of such organs do not alter the external appearance of the body; they afford no outward sign by which the inward state can be distinguished. But whenever the situation of organs is such as to place them within the reach of external examination, this mode of investigating their diseased affections is the simplest, the readiest, and the surest; and there is no part of the human body so well adapted for this kind of examination as the abdomen. Its walls are soft and yielding; some of its most important organs lie immediately beneath the surface; though they cannot be seen they can be felt; and several of their morbid conditions can therefore be ascertained with clearness and certainty.

Not only are some of the diseases of the abdominal viscera visible to the naked eye, but they are even strikingly expressed; for they either cause a permanent change in the configuration of the abdomen, or they produce a temporary alteration of its natural movements, or they occasion both effects. And as the abdomen affords the greatest facility for the external examination of its contents, so the varied and extended functions performed by its organs render this examination of paramount importance. There is no other part of the body in which so many different organs are crowded together; in which they lie so close to one another: in which they are so much intermixed; in which they are so liable, by the operation of internal morbid causes, to be removed from their natural situation; in which the diseases of one influence by sympathy to so great an extent the state of others; in which the symptoms or signs of disease are so numerous, so complex, so deceptive; in which disease is so apt to extinguish or embitter life, and the oversight, or the misconception of which proves so certainly injurious, and so often fatal.

Both in the male and in the female it often happens that diseases not to be ascertained, or at any rate exceedingly apt to be overlooked, or mistaken, if the region of the part affected be covered with its ordinary clothing, become manifest the moment the part in question is uncovered; or if not, are rendered obvious by other modes of inspection to which the removal of the clothing is indispensable. As an example of this, it may be worth while to give some illustration of the extent and value of the information to be derived from an external examination of the abdomen, when carefully and accurately performed, were it only to remove the obstacles sometimes opposed to this examination on the part of the patient from false delicacy, and to exhibit the mischiefs that may result from the neglect of it, on the part of the practitioner, whether from ignorance or from indolence.

The external examination of the Abdomen, or the Exploration of it, as it is technically termed, is comprised in simple inspection, manual examination, and percussion.

1. The simple inspection of the abdomen often affords valuable information. The mere alteration of its form is sometimes of itself sufficient to determine the seat and the nature of the disease. In each case of diseased organs the change is different; in each it is peculiar, and even characteristic. The abdomen may be affected with spasm, as in the disease called colic, or with inflammation, as in the disease called enteritis. Life may depend on the promptitude with which the true nature of the affection is detected. One set of remedies is required for one of these diseases, and a totally different set for the other. Remedies essential to the preservation of life, if the disease be inflammation, may be destructive of life, if the disease be merely spasm; and if, under the notion that the disease is spasm, the remedies proper for inflammation be not employed, death may be the consequence of the error in less than twenty-four, or even

twelve, hours. In both affections the pain may be the same; and several other symptoms may be similar, but the form of the abdomen may be alone sufficient to determine the true nature of the malady; for, if it be inflammation, the abdomen will be rounded, enlarged, and distended; while, if it be spasm, it will be drawn in and contracted. There are affections which place life in the most imminent danger, especially in children, in which it is difficult, if not impossible, to determine, from the symptoms alone, whether the seat of the disease be in the brain, or in the inner coat of the intestines. Suppose it be in the brain; one set of remedies are required, which must be applied to the head. Suppose it be in the intestines, a different sort of remedies is required, which must be applied to the belly. An index is sometimes afforded to the real seat of the disease, by the mere form of the abdomen; while its size, combined with its form, oftener affords a still more certain guide; and so does any deviation from its natural movements.

2. Manual examination affords still more correct and complete information relative to the condition of the abdominal organs. The size, the tension, the temperature, the sensibility of the abdomen, the presence or absence of unnatural tumours, or morbid growths within its cavity, the presence or absence of fluids, the nature and extent of the contents of the intestinal canal, may be ascertained with considerable precision by touch combined with pressure. Increase of temperature on the surface of the body is a most important sign of internal disease. Increase of temperature arises from a preternatural increase in the action of the arteries, and denotes inflammation of the part affected. All acutely inflamed organs are hotter than in their natural state, and if the inflammation be intense, the neighbourhood of the inflamed part gives to the hand of the examiner the sensation of pungent heat, which is always a sign not only of disease, but of exceedingly severe disease.

Diminished temperature, which arises from diminished action in the arteries, and an overloaded state of the veins, is no less important as a sign of disease. It always denotes a most dangerous condition of the system, the danger being in proportion to the coldness. It is the concomitant of the worst forms of fever which are ever witnessed in this country; fever with a cold skin being incomparably more alarming than fever with even a pungently hot skin. In that pernicious fever, of which we have lately had so much experience, termed cholera morbus, the first, the most sure, and the most alarming sign of the invasion of the malady, was coldness of the system, and especially of the abdomen, the main seat of the malady; and it was uniformly found that there was no one sign which afforded a better criterion of the extent of the danger, in any case, than the degree of coldness of the system in general, and of the abdomen in particular.

The physician may often form a judgment as to the seat, the nature, and the extent of abdominal disease, from the degree of sensibility of the abdomen to pressure with the hand; and, by practice, he may acquire such delicacy of touch as to be able to detect, by its means alone, morbid changes, even in deep-seated organs, to an extent, and with a degree of precision and certainty, far beyond what is commonly believed by practitioners.

3. That mode of external examination of the body termed percussion—namely, the mode of eliciting sounds from the surface, the nature of the sound produced affording a knowledge of the condition of the parts beneath, has opened to the modern practitioner a new source of information, the careful and skilful employment of which has afforded practical results of far greater precision and importance than could possibly have been anticipated. This mode of examination has been applied principally, and with the most valuable results, to the detection of the diseases of the chest; but application of it has recently been made, and not without very considerable advantage, to the detection of abdominal disease. M. Pierry, a young Parisian physician, has brought into a formal and matured shape this new application of a discovery of Anenbrugger, of which an excellent account is given by Dr. Forbes, in an article termed 'Exploration of the Abdomen,' in the *Cyclopædia of Practical Medicine.*

Our limits will not permit us to pursue this subject further. Our object has been rather to awaken than to satisfy curiosity; rather to indicate the nature and extent of the information to be acquired, than to supply it. Enough has been said to show that there is reason to congratulate both the medical profession and the public on the renewed attention which is now paid to the external or the physical signs of internal disease. The external examination of the body can never supersede other modes of investigation; but it may often afford essential aid to whatever other mode is adopted; and sometimes it is absolutely indispensable to the success of any other. With all the aids that can be applied to the task, the detection of internal disease is often difficult and very often uncertain, and the enlightened practitioner will gladly avail himself of every resource which is open to him, and will endeavour to derive from each the utmost information it can be made to afford.

The Father of Physic long ago said, 'Certain it is that he who examines the abdomen as well as the pulse, is much less likely to be deceived than he who does not.' And a distinguished modern, Baglivi, has confirmed this observation of Hippocrates in the following words:—'If physicians were always to examine the abdomen, upon first visiting the patient, more particularly in acute diseases, they would assuredly commit much fewer mistakes than they do at present, neglecting this method of exploration. The knowledge of the condition of the upper parts of the abdomen improves vastly both our treatment and our prognosis.'

ABDOMEN, in insects, has a somewhat different signification from the same term when applied to other animals, being used for the whole portion of the body of an insect behind the corselet (*thorax*), and including the back as well as the belly. It consists, in most cases, of a number of rings without any jointed members for locomotion, and uniformly incloses a portion of the intestines, though sometimes but a very small one. These rings, or very short hollow cylinders, are severally united with each other by a joint, by a membrane, or sometimes by an intimate junction, the exact line of which is not very apparent. The rings in some cases, as in the grub of the chameleon fly, slide into one another like the tubes of an opera-glass. Each ring is technically termed a segment (*segmentum*), virtually composed of two principal pieces, which, when distinct, are termed arches; the upper the arch of the back, the under the arch of the belly. In some cases these two portions are not distinct, but, when they are so, the two borders usually come into contact. When they do not, but remain free, one usually, more or less, overlaps the other as in bees. In caterpillars, grubs, and wingless insects, such as the flea, where the joining of the corselet with the abdomen is not apparent, the abdomen may always be known by the legs never being jointed with it; and in caterpillars it usually consists of all the body behind the six fore legs, which are always on the corselet.

ABDOMINALES, in Zoology, the name of a group of fishes, to which different naturalists have attached a more or less extensive signification, according to the particular principles of their several systems. The system of ichthyology (the knowledge of fishes) of Linnæus is founded upon the presence and position of the ventral fins (those of the belly) in relation to the pectoral (those of the breast); and these he justly enough regards as analogous to the fore and hind members of quadrupeds, and to the wings and feet of birds. Linnæus includes, in his order Abdominales, all those species which have the ventral fins placed behind the pectoral, or upon the abdomen, the cartilaginous fishes alone excepted; which, after the example of Ray, Willoughby, and Artedi, he very properly considers as forming an order apart. But this arrangement, though at first sight plausible, and apparently founded upon the modifications of important organs, is, in reality, extremely defective, and of little assistance in studying the natural affinities of fishes. The different nature of the medium in which these animals move, necessarily induces corresponding modifications in their organs of locomotion; and thus it happens, that the important functions of prehension and progression, which in birds and mammals are performed by the extremities alone, are executed by the tail; whilst the fins in fishes are of no further use than to balance the animal. These organs, and their different modifications, have, consequently, but a very slight influence upon the nature of fishes, compared with that which the extremities exercise upon land animals; and hence it is, that the Linnæan system of ichthyology, founded upon these modifications, fails altogether in arranging the different genera and species of this class of animals, according to these natural affinities.

M. Cuvier, perceiving the deficiency of the Linnæan system in this respect, revives the more correct and natural arrangement of Artedi; and after, first of all, dividing the class of fishes into the three great orders—Chondropterygii, Acanthopterygii, and Malacopterygii, according to the cartilaginous or osseous nature of their skeletons and fins, afterwards applies the principles of Linnæus, or the relative position of the pectoral and ventral fins, to subdivide the last of these orders into families. In its present acceptation, therefore, the term abdominales denotes a family, or subdivision of malacopterygious, or soft-finned fishes, only; and, in this restricted sense, includes the greater number of the fresh-water species, as well as those which, like the salmon, periodically migrate from the ocean to deposit their spawn in fresh-water lakes and rivers. M. Cuvier subdivides this family into five subordinate groups, all of which he has defined by appropriate and unequivocal characters. He denominates these subfamilies, cyprinoïdes, siluroïdes, salmonoïdes, clupeoïdes, and lucioïdes respectively, from the carps, silures, salmons, herrings, and pikes, the typical genera from which their characters are severally taken.

Salmon, given as a specimen of the family of Abdominales.

ABDUCTION (from *ab*, from or off, and *duco*, to lead) is an unlawful taking away of the person of another, whether of child, wife, ward, heiress, or women generally.

Abduction *of child.*—(See Kidnapping).

Abduction *of wife* may be either by open violence, or by fraud and persuasion, though the law in both cases supposes force and constraint. The remedy given to the husband in such a case is an action, by which he may recover, not the possession of his wife, but damages for taking her away; and also, by statute of 3 Edward I., c. 13, the offender shall be imprisoned for two years, and fined at the pleasure of the king. The husband is also entitled to recover damages against such as persuade and entice the wife to live separate from him without sufficient cause.

Abduction *of ward.* A guardian is entitled to an action if his ward be taken from him, but for the damages recovered in such action he must account to his ward when the ward comes of age. This action is now nearly superseded by a more speedy and summary method of redressing all complaints relative to guardians and wards,—namely, by application to the Court of Chancery, which is the supreme guardian of all persons under age in the kingdom.

Abduction *of heiress.* By a late statute, passed in the 9th year of George IV., the abduction of any woman against her will, who may have property either in possession or expectation, is declared to be a felony, and punishable by transportation for life or a shorter period, or to be imprisoned for any period not exceeding four years with or without hard labour. In addition to this punishment of the offender, the marriage, when obtained by means of force, may be set aside on that ground. In this case, as in many others, the law will construe *fraud* into force; and, consequently, in one case, where both the abduction and marriage were voluntary in fact, they were held in law to be forcible, the consent to both having been obtained by fraud.

Abduction *of women generally.* The forcible abduction and marriage of women is a felony. Here, and in the case of stealing an heiress, the usual rule that a wife shall not give evidence for or against her husband is departed from, for in such case the woman can with no propriety be reckoned a wife where a main ingredient, *i.e.* her consent, was wanting to the contract of marriage; besides which there is another rule of law, that 'a man shall not take advantage of his own wrong,' which would obviously be done here, if he who carries off a woman could, by forcibly marrying her, prevent her from being evidence against him, when she was perhaps the only witness to the fact.

ABEL, the second son of Adam. Some interpreters have maintained that he was the twin brother of Cain, but apparently without any authority from the language of Scripture. His history is contained in the fourth chapter of Genesis, where, we are informed, that he being a keeper of sheep, while Cain was a tiller of the ground, the two brothers offered sacrifices together to the Lord; the former bringing of the fruit of the ground for that purpose, and the latter of the firstlings of his flock. The offering of Abel alone was accepted; and the preference thus shown so excited the envy and anger of Cain, that, as they were together in the field, he rose up against his brother and slew him; thus for the first time staining the earth with human blood. There does not seem to be any reason for supposing that God was pleased with Abel's sacrifice, and offended with that of Cain, on account of the difference that there was between the offerings of which they were severally composed. It would rather appear that it was the opposite characters of the two brothers which made the sacrifice of the one acceptable, and that of the other the reverse. This view seems to be confirmed by the epithet which our Saviour applies to Abel in the twenty-third chapter of Matthew, *righteous* Abel; and also by the reason expressly assigned for Cain's enmity to his brother, in the third chapter of the First Epistle of John, where we are told that he slew him, 'because his own works were evil, and his brother's righteous.'

ABEL (CHARLES FREDERICK), a native of Germany, and a pupil of Sebastian Bach, was much distinguished as a composer and performer in the middle and towards the end of the last century. He served for some years in the celebrated band of the Electoral King of Poland, at Dresden; but, his talents being very inadequately rewarded, he quitted that service, in 1758, with only three dollars in his pocket, and reached England the following year, where he soon met with encouragement that did not end in empty praise. When the queen of George III. had her establishment fixed, Abel was appointed chamber-musician on it, at a salary of 200*l.* per annum; and shortly after he united with J. Christian Bach in forming a weekly subscription concert, which for many years continued to be highly patronised and liberally supported. His chief instrument was the *viol da gamba*, a small violoncello with six strings, now fallen into disuse. With this he produced an effect on his auditors which scarcely any one since has been able to achieve on bowed instruments, and principally by means of his *adagios*, or slow movements. 'His compositions,' Dr. Burney tells us, 'were easy and elegantly simple; for he used to say, "I do not choose to be always struggling with difficulties, and playing with all my might." In nothing was he so superior to all other musicians,' the historian of Music adds, 'as in writing and playing an *adagio*, in which the most pleasing yet learned modulation, the richest harmony, and the most elegant and polished melody, were all expressed with such feeling, taste, and science, that no musical production or performance with which I was then acquainted seemed to approach nearer perfection.' (*Hist. of Music*, vol. iv.) The critic, however, of the present day, who has compositions of the same kind by Haydn, Mozart, Beethoven, Clementi, Dussek, and Cramer, &c., fresh in his memory, will not deny the vast superiority of these later productions. Abel—judging him by his remains—possessed more taste than imagination—more knowledge of his art, and elegance in his manner of performance, than vigour of conception. Even Dr. Burney admits that 'his later productions, compared with those of younger composers, appeared somewhat languid and monotonous.' But we suspect the fact to be, that they were more accurately estimated when compared with the productions of a more advanced age. Abel was intemperate in the use of fermented liquors, and brought his life to a hasty close in the year 1787.

ABEL (NIELS-HENRI), born 1802; died 1829; aged twenty-six years and a-half. If we cannot place him in the first rank of analysts, it is because his early death prevented his competing with the great names of the age in that department in the *quantity* of his labours. But his first essays, compared with those of the best mathematicians, sufficiently indicate a talent which would have placed its possessor high in the ranks of science. He was born in the province of Christiansand in Norway, where his father was a poor clergyman. He commenced his studies at the cathedral school of Christiania, and at the age of sixteen showed a decided turn for scientific pursuits. In 1821 he entered the university, and soon afterwards published his first essay. In 1824 the government gave him an allowance of 600 dollars, to enable him to travel. He went, accordingly, through France, Germany, and Austria, and formed an acquaintance with M. Crelle, in whose journal, and in the *Astronomische*

Nachrichten of Professor Schumacher, most of his works are published. On his return, after two years of absence, he was appointed Professor in the University, which post he held till his death, which was brought on by over-exertion in his public duties.

Abel has linked his name to a remarkable discovery. It is well known that no *general* solution has ever been discovered of any class of equations above the fourth degree,—that is, no problem has hitherto been solved, in which the quantity sought has been multiplied by itself more than three times, in the conditions of the question. Some particular cases only have been fully investigated, and though all can be solved with more than sufficient nearness for practical purposes, yet a general and exact solution has never been found. Abel showed that such a solution never could be found, that the roots of an equation of the fifth degree and upwards did not admit of any general algebraical expression.

While the researches of Abel on elliptic functions excite the attention of all mathematicians, the elementary student may judge of the elegance of his analytical style, from a paper on the convergence of series in Crelle's Journal, in which some results, hitherto unnoticed, seem to lie on the very threshold of the subject. M. Crelle calls him, with justice, one of those geniuses who appear but once in a century.

A collection of his works is preparing for the press; but where, we are not informed.—[See *Dictionnaire de la Conversation et de la Lecture*, No. I., 1832.]

ABELARD, one of the most celebrated teachers of the twelfth century, both for his extraordinary talents and his misfortunes, was born at Palais, a little town in the neighbourhood of Nantes, in the year 1079. His father, a gentleman of fortune, and of considerable merit, spared no expense for the education of his son. Learning, having begun to revive a second time in the preceding century, had made considerable progress in France towards the end of the eleventh; and Brittany was not behind the general improvement. The far-famed Roscelin was from that country, though he was not the master of Abelard, as many writers have asserted.

But Brittany, fruitful as she was in celebrated teachers, was soon too narrow a field for Abelard, who had already learnt Hebrew, Greek, and Latin; and accordingly he went to Paris, whose University was the resort of crowds of students from all parts of Europe. Guillaume de Champeaux, the most skilful dialectician of the age, numbered Abelard among his pupils. But the pupil soon surpassed his master, and in the dialectic struggles of the day, he often challenged him to public disputations, so common in the twelfth century, in which the youthful pupil frequently vanquished his more tried and experienced antagonist. After this success, he became so puffed up with vanity, that he made enemies of all around him. His tutors, and many of his fellow pupils, became disgusted with him, and Abelard retired to Melun. But even here the anger of his exasperated master brought him into many troubles; in spite of which, however, a great number of pupils left De Champeaux to attend the lessons of the rival professor at Melun. This success induced Abelard to change his residence, and to remove nearer Paris, as the storm was now somewhat abated. But his arduous labours had so much injured his health, although he was then scarcely twenty-two years of age, that he was obliged, for some time, to discontinue his public lessons, and to seek, by repose, and breathing his native air, to restore his declining constitution. After the lapse of some years, he came back to Paris, where he found that his powerful antagonist had ceded his chair to a man of very inferior talents, who was all at once deserted by his pupils on the re-appearance of Abelard. This unforeseen circumstance forced De Champeaux to enter again into the arena, there to dispute with this scholastic Achilles, by whom he was again conquered, and compelled for ever to leave the field. Family affairs obliged Abelard to withdraw from the scene of his triumphs; and his conquered rival was at the same time appointed to the see of Châlons-sur-Marne. In consequence of this event, Abelard, at his return, did not resume his dialectic lessons: he went to Laon, in order to study divinity there, under the direction of Anselme; but his pride and his vanity having led him to commit the same faults there which he had committed at Paris, he suffered nearly the same severe consequences. The disciple of Anselme put himself forward as the master: taught divinity to the pupils, and, still more, taught them to despise Anselme; who, indeed, was unfit for his station, and altogether inferior to Abelard. The latter compared him to a tree of promising appearance at a distance, on account of its thick foliage, but whose nearer view disappoints us, when we find it bears no fruit. [*Abel., Epist. prima.*] However, Anselme had power enough to have him expelled from Laon, which he soon effected. Abelard now re-appeared in Paris, but as professor of divinity, and in a few days he was better attended by pupils than when previously most successful. He saw himself surrounded by the most eminent scholars of his age: Gui du Châtel, who became Pope Celestin II.; the still more famed St. Bernard; and above all, the illustrious John of Salisbury. Enriched by this extraordinary success, and intoxicated by his fortune, he now gave way to passions of a different kind. He cast his eyes on the fair Heloise, niece of Fulbert, a canon in the cathedral of Paris, and from that moment he thought of nothing but seducing her. In order the more readily to accomplish his ends, he proposed to the unsuspecting uncle to receive him into his house as a boarder, and he promised to give, in exchange, all the instruction which he might consider his niece to require. The canon, who was anxious that Heloise should be a star amongst the learned of the age, and who was rather parsimonious, was delighted to see his ardent wish likely to be accomplished, and that, too, without expense. It was exactly as if, according to Abelard's own words, the 'shepherd himself had introduced the wolf into the fold.' Amongst the things taught by Abelard to his ardent pupil, the art of love was the chief; and very soon the fair disciple surpassed her master. Their love was published all over Paris, before the good canon suspected anything wrong; but the negligence of Abelard in attending to his scholastic duties, excited so generally the satirical clamours of the students, and became so universally the topic of conversation at Paris, that at last the eyes of the uncle were opened to the consequences of his indiscretion. His niece, whose shame could no longer be concealed, fled to Brittany, and hid herself under the roof of Abelard's sister, where she gave birth to a boy, who was called Astrolabus; but the child died. Fulbert, enraged at this discovery, demanded the marriage of Heloise. Abelard, although ordained, yielded to his threats, as did Heloise herself, but with a great deal more reluctance. She seems to have been not so much actuated by any improper motives (as so many romantic writers, who have disfigured history, under the pretext of embellishing it, have been pleased to repeat), as because she thought that this union, being made public, would infallibly ruin the fortune of Abelard, and destroy that which was above all things dear to her—the present and future glory of her illustrious lover. She wrote a letter to Abelard, to dissuade him from the marriage, which is full of the most eloquent expressions. At last it was agreed that the marriage should be performed at Paris, and kept secret. But Fulbert, who was impatient that the honour of his family should no longer be the subject of public scandal, lost no time in making the marriage as public as possible. Heloise, convinced that the glory of her husband was endangered by their marriage being known, denied it in the strongest manner. Her uncle, enraged at her obstinacy, in which he thought her encouraged by Abelard, swore to revenge himself at least on his niece, who was at that time residing with him. Abelard, being informed how cruelly Heloise was treated by Fulbert, took her away, and placed her in the convent of Argenteuil, near Paris. Fulbert, believing that Abelard wanted to make a nun of his wife, in order to get rid of a mistress, vowed a cruel vengeance, which he was soon enabled to execute. He bribed the valet of Abelard to admit two wretches into the bed-room of his master at midnight, who mutilated him in the most atrocious manner. The miscreants were punished after the cruel fashion of the age; and the canon was condemned to lose all his fortune, and was banished from Paris. Heloise took the veil at Argenteuil, and Abelard went to bury his grief and his shame under the monastic garment in the Abbey of St. Denis. But he did not there find the repose which he sought. The monks of that convent soon hated him, on account of the freedom with which he reproached them for their dissolute habits, and for his having had the temerity to assert, and to prove, that their great patron, St. Dionysius, or St. Denis, was not the Areopagite, who was then as generally believed to be the patron of that church, as the reverse is now universally known to be the fact. But this opinion of his, well-founded as it was, shocked the prejudices of the monks, being contrary to the legends and miracles of the abbey, and, as such, was considered as subversive of the privileges of the order. The infatuated monks, enraged at the pretended heresy of his work on the Trinity, which was publicly burnt in council at Soissons, in 1121, and still more at his 'treacherous' assertions about St. Denis, accused him to the king of high treason.

To escape from the impending danger, the unfortunate Abelard fled, and took refuge near Troyes, placing himself under the protection of the Count of Champagne, that country being then independent of the crown (*Du Cange*), as to judicial power. Here he built the celebrated Oratory of Paraclet, where a number of pupils came again to him in his solitude, and prevailed on him to resume his lectures. Amongst these pupils came two furious fanatics, whom his enemies had incited against him, and who soon discovered fresh theological errors; this provoked his enraged calumniators to still further persecution of Abelard, till, about this time, the monks of the Abbey of Bruis, near Vannes, in Brittany, elected him their superior. But here again, as at St. Denis, his endeavours to establish order, and to suppress the licentiousness which prevailed in that monastery, drew on him the implacable hatred of the monks, who, having first tried to ruin his character by calumny, afterwards even attempted his life by poison. Heloise also was not without her share of troubles; for she was expelled, with the rest of the nuns, from the convent of Argenteuil, on account of the scandalous disorders which prevailed there, although, notwithstanding the calumnies which were circulated against her, she had conducted herself with the strictest propriety.

In this destitute condition, Abelard gave her the Oratory of Paraclet; and after eleven years of separation, saw her there at the consecration of the community. Her exemplary conduct procured her general admiration, and particularly that of the bishop; while Abelard himself governed the convent by his occasional visits, by his advice, and by his letters, which are still preserved, and which very curiously prove that he encouraged the nuns not only to acquire a thorough knowledge of Scripture, but also to study the Hebrew, Greek, and Latin languages, in which Heloise had the reputation of being a proficient. Heloise's love being, as was suspected, by no means extinguished, notwithstanding her having taken the veil, the visits of Abelard to the Paraclet gave rise to some scandal. Being still accused of heresy by his inveterate enemies, at the head of whom was St. Bernard, he resolved to defend himself in full council, which he accordingly did at Sens. The king, Louis VII., was desirous of being present, to hear the defence of so distinguished a man. Notwithstanding his eloquence, he was condemned in 1140, as he had been before in 1121. Persecuted, it may be said, rather for his boldness and freedom of thought, than for his errors in theology, he desired to appeal to the pope, and on his way to the pontiff, was stopped at Cluni, near Maçon, by Peter the Venerable, who tried to soothe his grief, and to appease his enemies. Shortly afterwards he became reconciled to St. Bernard; and consigning himself, for the rest of his life, to the closest retirement, he died two years after, in 1142, at the Priory of St. Marcel, having, by his sincere repentance, his resignation, and good conduct, excited the admiration of the monks and the clergy of France. He was buried at Paraclet, and the remains of Heloise were interred in the same tomb, twenty-one years after. This beautiful gothic tomb was removed to Paris in the year 1800, and placed in the cemetery of Père la Chaise in 1817, where it is now to be seen.

In Abelard's time, scholastic instruction was divided into two courses: the one, the 'trivium,' containing grammar, rhetoric, and dialectics or philosophy; the other, the 'quadrivium,' comprising arithmetic, music, geometry, and astronomy. Abelard understood all these sciences in the greatest perfection, for his time, and thereby obtained from his contemporaries the title of the all-accomplished master. He was considered to be the only person who understood the writings of Aristotle, which had been unknown in France until the preceding century, when they were communicated through the learned Jerbert, who, travelling in Spain, had learnt them from the Arabians. Notwithstanding all that has been said of Abelard's perfect knowledge of the writings of Aristotle, it is now well ascertained that the Greek text did not exist at that period in France, and that there were only partial Latin translations from the Arabic. All the quotations of Abelard from Aristotle, in every part of his works, are invariably in Latin, as well in the printed edition of Abelard as in the three different MS. copies which we have seen of his works in the British Museum.

In estimating Abelard's acquirements we must judge of them by the age in which he lived. Scholastic philosophy and theology were then the highest branches of learning, and it was Abelard's praise to have surpassed in these all his contemporaries. If we are to judge of this renowned disputant by what remains of him, we fear our judgment would be rather unfavourable. Among the Lansdowne MSS. of the British Museum the reader may see a copy of two of Abelard's dialogues, one between a Christian and a Jew, the other between a Christian and a philosopher. Words are wanting to express the utter insipidity and absence of all taste, energy, or life, which these spiritless compositions display; nor can we concede to them the praise of being written in Latin which will bear the test of strict examination. The crime of Abelard, for such we must call it, and his misfortunes, have given to his name a celebrity, to which we conceive most men would prefer an honourable obscurity. Pope's well-known epistle of Heloïse to Abelard, which is animated with the glowing fervor of the unfortunate lovers, while it is tainted with the impure imagination of the poet, has made the name of Abelard familiar to those who are, perhaps, only imperfectly acquainted with his true history.

The real historic interest of Abelard's life turns on the state of knowledge during the age in which he acquired his reputation. The works of Abelard were once thought worthy to be put in the Index by the Inquisition of Madrid, which is almost the only thing we know in their favour. As to the question whether Abelard himself knew Greek, we are inclined to think that he did to a certain extent, but whether he was well acquainted with any Greek authors, except perhaps the New Testament, seems to us doubtful. That he knew some parts of Aristotle and Plato, both of them probably through translations, is pretty certain. In the printed edition of Abelard's works (1616) a few Greek words occur here and there(pp. 241, 244, 247, 831), which, taken in connexion with the remarks upon them, undoubtedly prove, if these passages really were in his MSS., as we believe they were, that he must have had some knowledge of the Greek language. It appears that Greek was always studied in France during the ninth, tenth, eleventh, and twelfth centuries; though it was very imperfectly known, and confined to a few schools. Hebrew and Arabic, at that time, were both better known than Greek. The occasional visits of Greek priests into Western Europe served to keep alive a certain degree of knowledge of this language.

The most complete edition of Abelard, is *Petri Abælardi et Heloisæ Conjugis ejus Opera, nunc primum edita ex MSS. codd. Francisci Amboesii.* Paris, 1616, in 4to.

The edition in the British Museum, though it is in fact that of Amboise, bears the title of *Andreæ Quercetani* (Andrê Duchesne), as do several other copies. Andrè Duchesne is the author of the Notes and Commentaries at the end. There is a number of other editions, amongst which is that of the Letters published by Bastion, 2 vols. 12mo, Paris, 1782, with the text and translation; that of Fournier, 1796, with a Life of Abelard, by M. Delaunay, 3 vols. 4to.; that of Richard Rawlinson, London, 1714, 8vo.; that of Oxford, 1728. Brunet, in his Manual, gives an incomplete list of them.

The principal sources from which we have drawn this article are, first, the *Literary History of France*, from page 20 to 225, vol. ix.; *Bayle's Critical Dictionary* (Amsterdam edit.), 1740, 4 vols. folio; the *Universal Biography*; and the *Works of Abelard*, complete, Paris, 1616, 4to.

ABELE TREE, in Botany, the English name of the Populus alba.—(See POPULUS.)

ABELMOSCHUS, in Botany, a genus of the Mallow tribe, usually referred to *Hibiscus*, which see. It consists of plants having showy white, rose-coloured, or yellow flowers, with a rich deep purple or brown centre. The name is an alteration of the Arabic *habb êl misk*, or musk-seed, according to Forskahl.

ABENCERAGES, is the name given by Spanish chroniclers and romance writers to a noble family in the Arabic kingdom of Grenada, several members of which distinguished themselves during the period immediately preceding the fall of the Mohammedan empire in Spain. The history of the Abencerages is intimately connected with that of the then reigning dynasty of Grenada. In the year 1423 of our era died Yussuf III., a wise and valiant prince. He was succeeded by his son Mohammed VII., surnamed Al-Haizari, or the Left-handed, who followed the example and advice of his father in maintaining friendly relations with the Christian court of Castille, and with the Arab princes on the northern coast of Africa, but lost the affection of his subjects by his pride and tyranny. The discontent which soon manifested itself against the youthful monarch, was for a time kept in check by the watchfulness of his principal chamberlain Yussuf ben Zerragh, then the chief of the noble family, which probably derived from him the common designation of the Abencerages. But, in 1427, an open revolt broke out, which had been incited by one of the king's cousins, Mohammed al Zaghir. The royal palace, called the Alhambra, was invested by the conspirators. Mohammed VII., disguised as a fisherman, escaped to Africa, where the King of Fez, Mulei ben Fariz, kindly received him, while Mohammed al Zaghir ascended the throne of Grenada. Yussuf ben Zerragh, with most of the Abencerages, fled from his persecutions to Castille; and some members of the family who had remained at Grenada were put to death. John II., then King of Castille, yielding to the representations and entreaties of Yussuf ben Zerragh, negociated through him a treaty with the King of Tunis, to replace Mohammed VII. on the throne of Grenada. This plan succeeded. Mohammed VII., supported by his two allies, recovered his paternal dominions, and Al Zaghir suffered death for his treason. But the friendly relations between Grenada and Castille were soon interrupted, in consequence of the refusal of Mohammed VII. to fulfil certain engagements which he had entered into with John II. Hostilities broke out, and John declared himself in favour of Yussuf ben Alhamar, an aspirant to the throne, who had formed a strong party in the kingdom of Grenada. Yussuf ben Zerragh led the troops of Mohammed VII. to encounter the united forces of his opponents. But he fell in a decisive battle, which he lost, and Yussuf ben Alhamar occupied Grenada, while Mohammed VII. fled to Malaga. This second interruption of Mohammed's reign was, however, only of short duration. He regained his throne a second time after the death of Yussuf ben Alhamar, which took place within six months. Fresh hostilities with Castille soon commenced. The frontier provinces of Grenada were much infested by the incursions of the Castilian commander Cazorla. A son of Yussuf ben Zerragh, at the head of a select band of valiant knights, drew out his troops against Cazorla, and fell in a battle (1438), in which the Castilians sustained much loss. New disturbances soon broke out in the interior of Grenada. Mohammed VII. was (in 1444) once more dethroned by one of his nephews, Osmin al Ahnaf. But the claims of the latter to the throne were contested by another aspirant, Mohammed ben Ismaïl, who was supported by John II.; and, finally, in 1453, prevailed over his opponent. Soon after this, John II. was succeeded in the government of Castille by Henry IV., who was adverse to Mohammed ben Ismaïl, and renewed the hostilities which, from this time, took a turn decidedly unfavourable to the kingdom of Grenada. The Spanish historians mention that, about this time, an attempt at a revolution was made in Grenada by the Abencerages, which had for its object to confer the crown on one of their own family, Mohammed ben Zerragh, and that the Castilian commander, Medina Sidonia, took advantage of these disturbances to occupy the fortress of Gibraltar. The Arabic chronicles say nothing of such an event, and the whole story appears doubtful. If there be any truth in the report, it may be, that the Abencerages made another effort to place Mohammed VII. once more upon the throne, which, from their steady attachment to the cause of that unfortunate prince, seems not improbable.

Of the feuds of the Abencerages with the Zegries, another noble Arabian family in the kingdom of Grenada, who traced their descent from the Mohammedan kings of Cordova, of the massacre of thirty-six Abencerages, caused through the perfidy of their opponents, and how the survivors of the family ultimately embraced the Christian religion, and entered the service of Ferdinand of Castille, a highly interesting story is told in the *Guerras civiles de Granada*, by Gines Perez de Hyta, a work which professes to be a translation from an Arabic manuscript. Of the authenticity of this there seems, however, good reason to doubt. The work properly consists of two volumes, but in most editions only the first is reprinted, and copies of the second are said to be now extremely rare even in Spain. An English translation of the first part, by Thomas Rodd, appeared under the title of *The Civil Wars of Granada*, &c. London. 1803. 8vo. [See *Conde's Historia de la Dominacion de los Arabes en España*, vol. iii.]

ABEN ESRA, sometimes called Ebenare, or Evenare, by the scholastic writers, or with his complete name Abraham ben Meïr ben Esra, was a celebrated Jewish scholar, who lived during the twelfth century. The year of his birth, as well as that of his death, is unknown. He was born at Toledo, probably in A.D. 1093, and died, it is believed, about 1168, at an age of seventy-five years, or upwards. Of the history of his life, few details are known. The Rabbi Japhet Hallevi is mentioned as having been one of his early teachers. A considerable portion of his life was spent in travelling. He visited Mantua in 1145, and the island of Rhodes in 1156; in 1159 he was in England, and in 1167 we find him at Rome. His celebrity, even among his contemporaries, as a scholar, and as an accomplished writer of the Hebrew language, was very great. Moses Maimonides recommended his son to study the writings of Aben Esra in preference to all others; and the well-known grammarian, David Kimchi, and the traveller, Benjamin of Tudela, praise his vast erudition; while Juda ben Alcharizi, the successful Hebrew translator and imitator of Hariri, acknowledges his merits as a poet. Among ourselves Aben Esra has become known chiefly through his great commentary on the Old Testament, which, it seems, he wrote at different periods, between the years 1140 and 1167. It has been printed in the great Rabbinical editions of the Bible, which have appeared at Venice, Bâle, and Amsterdam, and there have been besides many separate editions of single parts of it. But, from the great number of his other writings, which are still extant, it is evident that Aben Esra must have bestowed as much attention upon mathematics, astronomy, philosophy, and medicine, as on philology; and his treatise in verse on the game of chess (edited by Thomas Hyde, Oxford, 1694) affords us a specimen of his success in poetic composition. For an enumeration of the works of Aben Esra, which are still preserved in MS. in several of the libraries of Europe, see the article 'Aben Esra,' by Hartmann, in *Ersch und Gruber's Encyclopædie*, vol. i.

ABER. This word, which is prefixed to the names of many places in Great Britain, is a Celtic term, and means, generally, the mouth or entrance of a river. It is sometimes defined as 'the fall of a small water into a greater,' which, of course, *includes* the terms 'mouth of a river,' and 'port or harbour.' Thus, the town of Aberbrothwick, in Scotland, is at the mouth of the river Brothick, and New Aberdeen is near the mouth of the Dee. In Wales, we have Abergavenny, at the confluence of the Usk and Gavenny; and Aberystwith at the outlet of the river Istwith.

ABERBROTHWICK, or more commonly ARBROATH, a town in Scotland, in the county of Forfar, at the mouth of the rivulet Brothic, from which its name comes. It is a royal burgh, having been created so by charter, granted in 1186, and renewed in 1589; and, in conjunction with Aberdeen, Montrose, Bervie, and Brechin, formerly sent one member to parliament. Aberbrothwick is now united with Bervie, Brechin, Forfar, and Montrose in sending a member. It is irregularly built, except in the parts of modern erection. The town-house contains several public offices, as well as a library and reading-room. The chief manufactures are sail-cloth, thread, and leather, which are exported, together with paving-stones and grain. Among the imports are flax, hemp, linseed, and tallow. A small but secure harbour (defended from the sea by a breakwater, and protected by a battery of twelve guns) enables the town to carry on this trade. There are two parish churches, and some dissenting places of worship. The population amounted in 1831 to 6660. There are the ruins of an abbey, founded in honour of St. Thomas-à-Becket, which was destroyed by the reformers in 1560. The last abbot was the celebrated Cardinal Beaton. Aberbrothwick is fifty-eight miles north-north-east of Edinburgh. Lat. 56° 32′ north, long. 2° 34′ west.

ABERCROMBY (SIR RALPH), a British general, distinguished for many gallant and important services. He was the son of George Abercromby, Esq., of Tullibodie, in Clackmannanshire, where he was born in 1738. After receiving a liberal education, he entered the army in March, 1756, as a cornet in the 3d regiment of Dragoon Guards. By the year 1787 he had reached the rank of major-general. When the war with France broke out, in 1793, Abercromby was sent to Holland, with the local rank of lieutenant-general, in the expedition commanded by the Duke of York. His bravery during the prosperous commencement of this attempt was not more conspicuous than the humanity with which he exerted his best energies in the disastrous sequel to alleviate, as far as possible, the miseries of the sick and wounded troops, whom he was charged to conduct in their retreat.

Soon after his return to England, in April, 1795, he was made a Knight of the Bath; and in August of the same year, he was sent out to the West Indies, as Commander-in-Chief of the forces there. In this quarter he took from the enemy, in succession, Grenada, Demerara, Essequibo, St. Lucia, St. Vincent, and Trinidad. The last of these colonies fell into his hands in February, 1797. He then returned to Europe, having been previously raised to the rank of lieutenant-general; and on reaching England, he was rewarded for his valuable services by receiving the command of the Scots Greys, and the appointment of lieutenant-governor of the Isle of Wight. In the following year, on the breaking out of the rebellion in Ireland, Sir Ralph proceeded thither, as commander-in-chief; but after he had held that office for a short time, it is understood that his unconcealed aversion to the service in which he was engaged, and some differences of opinion with his superiors as to certain operations, led to a new arrangement, by which he was transferred to the chief military command in Scotland, and the governorship of Fort Augustus and Fort George. He was soon, however, called again to active service abroad, on occasion of the second expedition sent against the French in Holland, in August, 1799, with the conduct of which he was entrusted, before the arrival of the Duke of York. It proved, as is well known, equally unfortunate with the former; but it did not the less afford many opportunities to General Abercromby of displaying his activity, intrepidity, and high military talent. In 1801, he was employed to command the English forces despatched for the relief of Egypt; and, in spite of the utmost exertions of the French to prevent his design, he effected the landing of his troops, on the 8th of March, at Aboukir, though not without the loss of 2000 men. A few days after, the enemy made a general attack upon the invading forces, as they lay encamped near Alexandria, but were speedily repulsed. On the 21st, was fought, on the same ground, the more obstinate and bloody engagement, usually designated the battle of Alexandria, in which the French were again driven back at all points. But the victory of our countrymen was purchased at the cost of the life of their gallant commander, who was unhorsed and severely wounded at an early period of the action, by one of the enemy, whom, notwithstanding, he disarmed, delivering his sword to Sir Sidney Smith, whom he soon after met. Then remounting his horse, 'he concealed his situation,' says the despatch of Lord Hutchinson, 'from those about him, and continued in the field giving his orders with that coolness and perspicuity which had ever marked his character, till long after the action was over, when he fainted through weakness and loss of blood.' The injuries which he had received, and which he thus nobly bore in silence, were past the skill of surgery: he was immediately conveyed to the ship of the Admiral, Lord Keith, and there lingered till the 28th, when he expired. His body was interred in the burial-ground of the Commandery of the Grand Master, under the walls of the Castle of St. Elmo, near the town of La Valetta, in Malta. A monument has since been erected to his memory, by order of the House of Commons, in St. Paul's Cathedral. Sir Ralph Abercromby, whose private character was as excellent as his public merits were great, left four sons, of whom the present Lord Abercromby is the eldest. On his death, his widow was created Baroness Abercromby, with remainder to her issue male by her late husband. A pension of 2000*l.* a year was also settled upon Lady Abercromby and the three succeeding inheritors of the title.

ABERDEEN. This name is common to two places situated very near to each other, between the rivers Don and Dee, on the eastern coast of Scotland, and in the shire of Aberdeen. They are often confounded, though they are distinct, both in their municipal and ecclesiastical constitutions.

Old Aberdeen, the more northerly of the two, on the right bank of the Don, was only a village (though said to be of some note) until the twelfth century; when it was elevated to the rank of a city by the removal to it of the bishopric of Morthlac, in Banffshire. The cathedral of St. Machar is now nearly demolished; a small part only being retained for the celebration of divine service. There is also a neat town-house, erected towards the close of the last century, and a bridge of one Gothic arch, built by Bishop Cheyne, in the early part of the fourteenth century, up to which bridge the river Don is navigable. There are some small charitable foundations; but the University (King's College) is the institution most deserving notice. This is not to be confounded with Marischal College, in New Aberdeen, for they are not under the same management, and all attempts to unite them have proved vain; although, in some things, their respective directors may co-operate. King's College was founded by James IV. in 1494, in which year he received the pope's bull for its institution, and it was opened for the reception of students some time previous to 1506, Bishop Elphinstone having in the interval greatly aided also in its establishment. It possesses a library of nearly 13,000 volumes,[*] and can claim, from the Stationers' Company of London, a copy of every book entered at their hall. There are also 134 bursaries or endowments for the support of students, varying from under 5*l.* to 50*l.* per annum. The number of students in 1826 was 235. In the College Chapel, the body of the founder is deposited. The population of Old Aberdeen has probably increased, as that of the parish, which extends considerably beyond the city, had risen, between 1821 and 1831, from 18,312 to 25,017.

New Aberdeen, though often called a city, either from its importance, or from its being confounded with the place last mentioned, is only a royal burgh; having, at the head of its corporation, a provost and four baillies. It is now united with Old Aberdeen in the return of a Member to Parliament. It stands on a rising ground, or rather upon four small eminences, on the north or left bank of the Dee, which forms its harbour, and over which is a fine granite bridge of one arch, having 132 feet span. The town-house, the prison, and a Masonic lodge are united in one building, in the middle of which is a tower with lofty spires. In this building is the town armoury, and an instrument for beheading, similar to the guillotine, termed a Maiden. The Bridewell was built in 1819, and has five floors, with a garden, and areas or yards: each convict has two apartments. There are also military barracks for above 500 men, and a theatre open for three or four months in the year. There are seven places of worship of the establishment,—namely, five chapels of ease and two kirks: these last are under one roof. The east kirk is an ancient Gothic structure, with a tower and five bells; the west kirk is of more modern architecture. There are, besides, many dissenting places of worship, whereof four belong to the Seceders, three to the Episcopalians, and the remainder to the Baptists, Methodists, Catholics, and other religious denominations.

There is a poors'-hospital, behind the town-house, enriched in the course of years by various benefactions, from which 400 aged poor receive allowances, and by which forty children are maintained and educated. Gordon's Hospital, endowed by Robert Gordon, a burgess of Aberdeen, in 1729 and 1730, receives and educates eighty-four boys in several branches of useful knowledge.[†] There are some other charities.

Marischal College takes its name from George Keith, Earl Marischal, who founded it near the close of the sixteenth century (1593 or 1594). It is an irregular building, in the north-east part of the city, and contains a museum, a philosophical apparatus, and an observatory elevated sixty feet above the court in which it stands. The library consists of 10,000 volumes, although this University is not entitled to a copy of every work published for sale; like King's College, which is, indeed, regarded as a depository for both these Universities. The number of students in the session 1816-1817, the latest period of which we have been able to obtain an account, was 220, besides 105 divinity students, attending alternately here and at King's College. There are here, also, 106 bursaries, which attract to Aberdeen many indigent students.—[See *Journal of Education*, Nos. 7, 8.]

The manufactures of Aberdeen are woollens, linens, and cottons, especially hosiery, though this last branch of industry was much depressed in the late war. Coarse yarn is exported as such, or worked up into canvas, sail-cloth, sheeting, &c.; and the printed cottons are in considerable repute for quality and colour. Thread, carpets, and coarse cloths; nails, cordage, and materials for ship building, are also among its productions. These articles, with granite, (of which 7000 tons, for paving, are sent yearly to London,) salmon, (caught in the Dee and Don,) and grain, are the chief exports; and, in return, besides articles of ordinary consumption, they bring in wool from London and Newcastle, flax from different parts of England and Holland, and coals from England and the Firth of Forth. There are some breweries in the town, as also iron founderies, and ship-building yards, at one of which several steam-vessels, of between 500 and 600 tons, have been fitted out.

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[*] This is, at least, as far back as 1818.

[†] The statement of the number of persons receiving the benefit of these charities is from the *Edinburgh Gazetteer*, published in 1827. Such numbers are liable, of course, to fluctuation.

The harbour is spacious and safe; and a pier, erected under the direction of the celebrated Smeaton, and subsequently lengthened, has caused a diminution of the bar which once obstructed the entrance, so that vessels drawing seven or eight feet of water can enter at any time. By a parliamentary return of 1830, it appears that 350 vessels, with an aggregate tonnage of 46,201, belonged to the port. There is a navigable canal, eighteen miles in length, from this place to the bridge over the Don at Inverury.

An English garrison, which occupied the castle in the beginning of the fourteenth century, having been cut off by the townspeople, the fleet of Edward III. attacked and devastated Aberdeen in 1333; and a victory gained over an English detachment at Dunottar drew down a more complete destruction from Edward's army in 1336. It was on its being rebuilt after this calamity, that the designation of New Aberdeen was bestowed. Many of the citizens were slain in the defeat which the Covenanters suffered from Montrose in 1644.

New Aberdeen is 108 miles N.N.E. of Edinburgh, and 425 N. by W. of London; lat. 57° 9′ N., and long. 2° 8′ W. of Greenwich. The population of the burgh and parish, in 1821, was 26,484; by the last returns in 1831 it had increased to 32,912.

ABERDEVINE (*Carduelis spinus*, Cuvier; *Fringilla ligurina*, Ranzani), sometimes called the siskin, a well-known song-bird, which has some resemblance to the green variety of the canary-bird, but there is considerable difference in individual birds with respect to the brightness of colouring. Fleming's specific description, therefore, 'the head above, black; the neck, breast, and rump, lemon yellow,' though it applies to individual male birds, will not apply to others, and not at all to the female; as we have seen male birds, at least two years old, with the head grey rather than black; and others with neck, breast, and rump as bright yellow as the marks on the wings of the goldfinch. In the latter instances the head was jet black.

Syme conjectures that if the aberdevine is not the original stock-bird of the cage-canary, it is very similar to it, and ought to be considered rather a variety than a distinct species; but if he had looked closely at the points of the bills, the lengths of the tails, and particularly at the motions and manners of these several birds, we think he would have come to a different conclusion.—[See Canary.]

Sepp has delineated the nest of the aberdevine in the cleft of an oak, built with dry bent mixed with leaves, and profusely lined with feathers; the base neatly rounded, and the feathers projecting above the rim, and concealing the eggs, which are bluish-white speckled with purplish red, like those of the goldfinch. Temminck, again, says it builds in the highest branches of the pine.

It breeds in the north of Europe, and only visits Britain, Germany, and France in the autumn and winter. It is represented in some books as very irregular in its migrations, particularly to this country; but we suspect that this opinion has perhaps arisen from the irregularity of observations, for, since our attention has been directed to the subject, we have remarked its arrival about Lee, in Kent, to be almost as regular as the departure of the swallows, which takes place about the same time. During its winter stay with us, the aberdevine feeds chiefly on the seeds of the birch and alder.

As a cage-bird it is frequently paired with the canary, to produce what are termed mule-birds; but it is, besides, a lively and persevering songster. One which we possessed, though the colours were so dull as scarcely to distinguish it from a hen-bird, sang for ten or eleven months in the year. Its song would be very pleasing, though not so plaintive as that of the linnet, nor so sprightly as that of the goldfinch, if it did not at intervals introduce a jarring guttural note, almost like the croak of the nightingale when angry.

ABERGAVENNY, a town in the county of Monmouth, at the confluence of the Usk and Gavenny, situated in a range of meadows, surrounded by several hills. There is a fine old bridge, of fifteen arches, over the Usk; also an ancient and spacious church, as well as the remains of a castle, and of a Benedictine priory founded soon after the Conquest. The town is long and straggling, the streets narrow, and the houses irregularly built; but considerable improvements have been made by enlarging the market-place and removing projections. There are several Dissenting meeting-houses, a Catholic chapel, a grammar-school, a Lancasterian, and several Sunday schools. The principal trade is in wool, of which a considerable quantity is sold in the market in the months of June and July. The supply of coal and iron afforded by the neighbouring mountains has given rise to several iron-works in the surrounding district. The population in 1831 was 4230. The Monmouthshire and Brecon canal passes near the town, and gives facilities for its trade and that of the neighbourhood. Abergavenny is supposed to have been the Roman station of Gobannium, so called from the river Gobannius (Gavenny), and once possessed a charter of incorporation, which was forfeited in the reign of William III. It is 14 miles W. by N. of Monmouth, and 143 W. by N. of London; lat. 51° 59′ N., long. 2° 58′ W.

ABERNETHY (JOHN), a distinguished surgeon, born in the year 1763-4, either at the town of Abernethy in Scotland, or at that of Derry in Ireland, for each claims the honour of having been the place of his birth. He died at Enfield, after a protracted illness, on the 18th of April, 1831, in the sixty-seventh year of his age. In early youth he removed from the place of his birth, and resided with his parents in London. He received the elements of grammatical and classical instruction at a day-school in Lothbury, but it does not appear that he enjoyed the advantage of any higher education than that afforded by the ordinary day-school of that period. At the usual age he was apprenticed to Sir Charles Blick, surgeon to St. Bartholomew's Hospital, under whom, and especially in the wards of this hospital, he had ample opportunities of acquiring a thorough knowledge of his profession, of which he availed himself with diligence. Competent judges, who observed at this early period the qualities of his mind and his habits of study, predicted that he would one day acquire fame if not fortune. Though he appeared before the public early as an author, and though his very first works stamped him as a man of genius, endowed with a philosophical and original mind, yet he did not rise into reputation nor acquire practice with rapidity. In 1786 he succeeded Mr. Pott as assistant-surgeon to St. Bartholomew's Hospital, and shortly afterwards took the place of that gentleman as lecturer on anatomy and surgery. For a considerable time he had but few pupils, and he was at first by no means a good lecturer, his delivery being attended with a more than ordinary degree of hesitation. On the death of Sir Charles Blick, his former master, he was elected surgeon in his room; and, subsequently, St. Bartholomew's Hospital obtained under him a reputation which it had never before acquired.

Abernethy was a pupil of John Hunter, and the earnestness and delight with which, at an early age, he received the lessons of this his great master, were indications of the soundness of his own judgment. It was from this profound and original thinker, who exercised an extraordinary influence over the understanding, tastes, and pursuits of his young pupil, that Abernethy derived that ardent love of physiology, by the application of which to surgery, he was destined to convert a rude art into a beautiful science. He made himself thoroughly acquainted with anatomy, but it was that he might be admitted into the *then* new world of physiology; he studied structure, but it was that he might understand function: and the moment he had obtained a clear insight into these two sciences, he saw the applications of which they were capable to the treatment of disease. From that moment he looked with contempt on the empiricism then almost universal in surgery; he ridiculed its jargon; he exposed the narrowness of its principles, if it be at all allowable to designate by such a term the ignorant dogmas which alone regulated the practice of the surgeon. But he did not content himself with deriding what truly deserved contempt; he laid the foundation of, and mainly contributed to build up, a new edifice. By the diligent study of nature, and by continual reflection on what he saw, and, as he himself expressed it, the concatenation of what he saw, he reduced to order what he found a chaos. Hitherto the surgeon had looked upon the class of diseases which it was his part to treat, diseases which almost always have a local seat, as diseases which have also a local origin, and consequently as diseases which are to be cured by local applications. To Abernethy belongs the great merit of first perceiving, in its full extent, the utter incompatibility of this notion with the true phenomena of disease, and the inertness, or, when it ceased to be inert, the mischievousness of the treatment that grew out of it. In a work abounding with acute and original observation, and exhibiting comprehensive and philosophical views, entitled, *The Constitutional Origin and Treatment of Local Diseases*, he lays down and establishes this great principle:—that local diseases are symptoms of a disordered constitution, not primary and independent maladies; and that they are to be cured by remedies calculated to make a salutary impression on the general frame, not by topical dressing, nor any mere manipulations of surgery. This single principle changed the aspect of the entire field of surgery, and elevated it from a manual art into the rank of a science. And to this first principle he added a second, the range of which is perhaps somewhat less extensive, but the practical importance of which is scarcely inferior to that of the first—namely, that this disordered state of the constitution either originates from, or is rigorously allied with, derangements of the stomach and bowels, and that it can only be reached by remedies which first exercise a curative influence upon these organs. The benefit daily and hourly conferred upon mankind by the elucidation and establishment of these two principles, both by the prevention and the mitigation of disease and suffering, it were vain to attempt to estimate, and it is not easy to pay to their author the debt of gratitude which is his due.

Further, the same philosophical view of the structure and functions of the human frame, which enabled this acute physiologist so greatly to improve the theory and practice of surgery, suggested, and at the same time armed him with the courage to perform, two operations in surgery bolder than any that had ever before been achieved, and the repetition of which has since been attended with splendid success—namely, the tying the carotid and the external iliac arteries. The announcement of the performance of these capital operations, at once established his reputation as a surgeon, and increased the credit of the English school throughout Europe.

Great, however, as was the reputation which this distinguished man acquired as an anatomist, physiologist, and surgeon, it is probable that he owed his celebrity chiefly to his success as a teacher. Gifted with the genius to master and extend his science, he was endowed with the still rarer capacity of communicating to others in a clear, succinct, impressive, and fascinating manner, whatever he himself knew. Easy and fluent, yet not inelegant—abounding with illustration and anecdote, yet methodical—logical, yet often witty, and occasionally humorous almost to coarseness—seldom impassioned, yet always impressive, and never allowing the attention of his audience to flag for a single moment,—it was rare, indeed, that he failed to convince whoever heard him, and as rare that he failed to make whoever was convinced a decided partizan. Nevertheless, a highly competent witness, speaking apparently from a careful and mature examination of the impression made upon his own mind by the prelections of his master, gives the following account, which, if true, is decidedly unfavourable as to the ultimate result of the mode and spirit of his lecturing. 'He so eloquently expounded some of the highest truths,' says Dr. Latham; 'he so nicely disentangled the perplexities of many abstruse subjects; he made that so easy which was before so difficult,—that every man who heard him feels perhaps to this day, that for some important portion of his knowledge he is indebted to Mr. Abernethy. But he reserved all his enthusiasm for his peculiar doctrine; he so reasoned it, so acted it, and so dramatised it (those who have heard him will know what I mean); and then in his own droll way he so disparaged the more laborious searchers after truth, calling them contemptuously "the Doctors," and so disported himself with ridicule of every system but his own, that we accepted the doctrine in all its fulness. We should have been ashamed to do otherwise. We accepted it with acclamation, and voted ourselves by acclamation the profoundest of medical philosophers, at the easy rate of one half-hour's instruction. The great Lord Chatham, it is said, had such power of inspiring self-complacency into the minds of other men, that no man was ever a quarter of an hour in his company without believing that Lord Chatham was the first man in the world, and himself the second; and so it was with us poor pupils and Mr. Abernethy. We never left his lecture-room without thinking him the prince of pathologists, and ourselves only just one degree below him.'

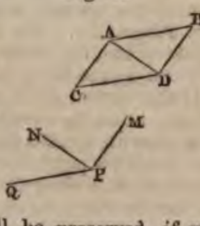
If this were, indeed, the ordinary result, then it must be admitted that the excellence of Mr. Abernethy, as a teacher, was, after all, but of a secondary order. *He* only teaches well who sends his pupil away thirsting after truth, determined to search for it, feeling that he has a clear conception of the manner in which he is to get at it, and, at all events, in no mood to be satisfied with anything but the entire truth.

The private character of Mr. Abernethy was blameless. He was highly honourable in all his transactions, and incapable of duplicity, meanness, artifice, or servility. His manners in the domestic circle were gentle, and even playful; he gave to those about him a large portion of what his heart really abounded with—tenderness and affection; and on his part he was tenderly beloved by his children and by all the members of his family. In public, and more especially to his patients, his manners were coarse, capricious, churlish, and sometimes even brutal. It would not be difficult to account for this anomaly were there any use in pursuing the investigation: his conduct in this respect merits unqualified censure. If but one-half of the stories that are told of him be true, the feelings they should excite are disgust and indignation. Without doubt it is the interest of every patient to state his case to his medical adviser in as few and plain words as possible, and then to listen without interruption to the counsel that is given him; but no one knew better than Mr. Abernethy how utterly ignorant even the educated classes are of the structure and functions of the animal economy, and how completely they have been excluded from the means of obtaining any information on these subjects. No one knew better than he that in the cases in which he was consulted there was often real suffering, though there might be exaggerated statement and unreasonable complaint; that suffering is not the less suffering because it is self-inflicted, and that it is bitter indeed when the very person from whom solace is sought treats it with derision and reproach. To listen to the interminable details of a bewildered and possibly a selfish hypochondriac may, indeed, be a 'trial of temper;' but the deportment of the medical practitioner, even towards such an hypochondriac who applies to him for guidance and aid, ought to be under the control of principle, rather than of feeling. Whatever be the folly of a patient, it can never forfeit his claim to humanity,—of which the physician, from the knowledge which his profession gives him of the weakness, infirmity, and suffering of human nature, ought to be more observant than any other human being.—[For a list of the various Tracts published by Mr. Abernethy, see Watt's *Bibliotheca Britannica*. A collected edition of his surgical works appeared in 1815, in 2 vols. 8vo.]

ABERRATION (of Light), an astronomical phenomenon, being an apparent alteration in the place of a star, arising from the combined motion of the spectator, and of the light which brings the impression of the star to his eye. We should, however, premise, in order that the reader may not form too large a notion of aberration, that it is never so much as 21″, that is, the apparent place of the star differs from its real place less than the *ninetieth* part of the apparent diameter of the sun. It is no wonder, therefore, that practical astronomy was considerably advanced before this discovery was made. If our sense of vision were perfect, or if light moved no faster than a rain-drop, we should have *terrestrial aberration*, that is, objects would change their relative places when we began to move, and if we went as fast as a ray of light moved, the utmost confusion would be the consequence. When we ride in a carriage, into which the rain is beating, we mistake the direction of the rain, for the cause of which phenomenon, see APPARENT MOTION. But as light moves with a velocity which imagination cannot conceive, about 200,000 miles in a second, its motion is so great compared with any we can give ourselves, that its passage from any one terrestrial object to another may be considered as instantaneous. The motion of a spectator on the earth which goes round the sun at the average rate of about eighteen miles in one second, though less than the ten thousandth part of that of light, is nevertheless sufficient to cause a small variation in the place of the star, perceptible by good astronomical instruments.

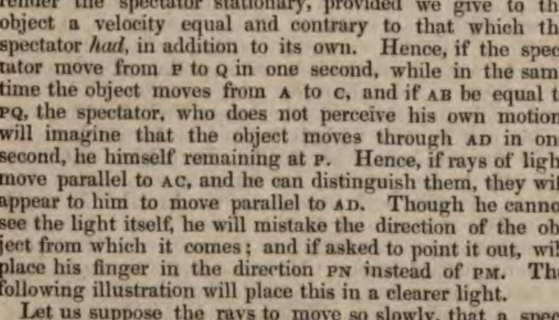
We know (see APPARENT MOTION) that if a body A be struck in two different directions at the same instant, with impulses which would separately carry it through AB and AC in one second of time, the result of the combined impulses is, that it moves in one second through AD, the diagonal of the parallelogram, whose sides are AB and AC. Again, if the spectator and the object at which he is looking are both in motion, the appearances presented by the motion will be preserved, if we render the spectator stationary, provided we give to the object a velocity equal and contrary to that which the spectator *had*, in addition to its own. Hence, if the spectator move from P to Q in one second, while in the same time the object moves from A to C, and if AB be equal to PQ, the spectator, who does not perceive his own motion, will imagine that the object moves through AD in one second, he himself remaining at P. Hence, if rays of light move parallel to AC, and he can distinguish them, they will appear to him to move parallel to AD. Though he cannot see the light itself, he will mistake the direction of the object from which it comes; and if asked to point it out, will place his finger in the direction PN instead of PM. The following illustration will place this in a clearer light.

Fig. 1.



Let us suppose the rays to move so slowly, that a spectator can be furnished with a tube long enough for light to take some perceptible time in passing from one end of it to the other. This will do for our purpose, since, though by such a supposition the aberration will be very much increased, yet the effect, and the reason of it, will be of the same kind as if light were supposed to have its real velocity. The star being at an immense distance, the rays which reach the spectator in different parts of the second may be called parallel, without sensible error. Thus, while in one second the spectator moves from A to B, he receives rays of light in the direction indicated by the dotted lines. The question now is, in what direction must he hold the tube, so as to see the star through it? If he were at rest, that direction would evidently be AC.

Fig. 2.



Let AB be the line described by the spectator in one second, during which time let a ray of light move from *a* to B, or from C to A. Join A*a*, and let A*a* be the length and direction of the tube. Divide the second into any number of equal parts, say six, and carry the tube into the various positions which it will successively occupy. Consider a ray of light as a succession of little particles moving one after another in a straight line. Then when the eye has come to P, the particle *a* will have come to *p*; when the eye is at Q, the particle will be at *q*, and so on. We have then so placed the tube, that its motion will not interfere with that of the ray, which moves as freely in the moving tube as it would do if there were no tube. To the spectator, who does not perceive his own motion, the tube is stationary, and the ray of light appears to come down it; therefore A*a* will be the direction in which he sees the star, instead of AC. The angle CA*a*, contained between the real and apparent directions, is what is called the *aberration*. Here *a*A is the diagonal of the parallelogram B*a*CA, in which *a*C is equal and opposite to AB, as before noticed. To apply this, we must remark,—

1. That the above figure is much distorted, since AB is not the ten thousandth of *a*B; whence the aberration will be very small.

2. That the aberration is in the plane passing through AB, the line of the earth's course for the moment, and through the real direction AC of the star; whence, as the earth changes the direction of its motion in going round the sun, the direction of the aberration will also change.

3. That we have committed an error in supposing the lines AC and B*a* to be parallel, since they meet at the star; which error, on account of the star's enormous distance, will be imperceptible.

4. That AB is not properly the spectator's motion round the sun only, but compounded of that and his motion round the earth's axis; the latter, however, being at most not one-third of a mile in a second, while the former is eighteen miles per second, does not produce any sensible aberration.

5. The real direction AC of the light may be considered as the same at every part of the earth's orbit, on account of the distance of the star.

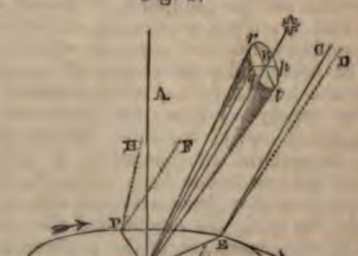
6. The aberration always throws the star apparently nearer to the earth's course, that is, A*a* is always within the angle CAB.

7. The aberration is greater or less according as the angle CAB is nearer to, or further from, a right angle, and is greatest when CAB is a right angle. This result may readily be proved by those who understand trigonometry, if they recollect that AB and *a*A are given, being the velocity of the earth and the *apparent* velocity of light, and that

$$\sin \mathrm{A}a\mathrm{B}, \text{ or } \sin \mathrm{CA}a = \frac{\mathrm{AB}}{a\mathrm{A}} \sin a\mathrm{BA} = \frac{\mathrm{AB}}{a\mathrm{A}} \sin \mathrm{CAB}.$$

Let us suppose, which will be exact enough for our purpose, that the earth moves in a circle (the ecliptic), of which the sun is in the centre. The line SA, perpendicular to the plane of the ecliptic, looks towards the *pole* of the ecliptic. Let SB be the direction of a star, PSQ perpendicular in the plane of the ecliptic to SB, and RST perpendicular to PSQ in the same plane. When the earth is at E, it is moving in the direction EM perpendicular to SE, and the star, from its great distance, is in the direction EC parallel to SB.

Fig. 3.



Hence the aberration takes place in the plane CEM, that is, the star is a little lowered towards EM, and appears in the direction ED. Let the needle SN move round the circle with the earth, so as always to indicate the direction in which the earth is moving, that is, SN is always parallel to EM, and perpendicular to SE. The plane BSN being parallel to the plane CEM, is the plane in which aberration would appear to take place if the spectator were at S, and S was moving; but as the spectator does not perceive his own motion, let us suppose him placed at S, and the same aberration to take place in the plane BSN, which really does take place in CEM. By what has been said, the aberration is greatest when the needle points to Q or P, that is, when the earth is at T or R; and least, when the needle points to T or R, that is, when the earth is at P or Q; because the angle BSN is a right angle when N is at P or Q, and differs most from a right angle when N is at T or R. Hence the aberration increases as the earth moves from P to T, diminishes from T to Q, increases from Q to R, and decreases again from R to P. The line in which the star appears, moves round SB in the course of a year, and describes a cone, while the star appears to describe a small oval or ellipse about B, the greater axis of which is parallel to PQ, and the lesser to RT; such as *prqt*, in which *p* is the apparent place when the earth is at P, and so on. This deviation is completed in the course of a year.

When the star itself is in the pole of the ecliptic, or is seen in the direction SA, the angle ASN is always a right angle, the aberration is always of the same magnitude, and the apparent path of the star is a circle. As we take stars in which SB is more inclined to the ecliptic, the oval becomes flattened in proportion to its length, so that when the star is in the ecliptic, it appears to vibrate backwards and forwards in a straight line, going and returning once in each year.

If the star be on the solsticial colure, the points P and Q will be the equinoxes, and R and M the solstices. The aberration will consequently be greatest at the solstices, and least at the equinoxes. We shall refer to this case presently.

The stars appear to us to lie on a large sphere, of which we are at the centre. [See APPARENT MOTION, SPHERE.] We may represent the phenomenon on a common globe by drawing a small ellipse or oval round the star, the major axis of which is parallel to the ecliptic, and the figure of which is more or less flattened as the star is nearer to, or further from, the ecliptic. The major axis will always be an arc of 41″, and the minor axis will be 41″ multiplied by the *sine* of BSM or the star's latitude.

Previously to entering upon the quantity of aberration, we shall give some account of the discovery, which is one of the most remarkable in the history of science. The arguments for the motion of the earth, though tolerably conclusive, were yet principally derived from the great simplicity of this hypothesis in comparison with others, since all the phenomena then observed could be equally well explained upon the supposition, that the other planets moved round the sun, at the same time that the sun moved round the earth. It remained, therefore, to find some *experimentum crucis*, some phenomenon, which admitted of no *other* explanation except what could be derived from the earth's motion. The first idea which suggested itself to astronomers was, that if the earth really moved, the stars would appear to change their places; though they did not count much upon this, since they knew that the distance of the stars might be so great, that the whole diameter of the earth's orbit would be too small a change of position to cause any perceptible change of place. [See PARALLAX.] To illustrate this, suppose that when the earth is at Q, we look at the star in the direction QG, and when it is at P, in the direction PF. Draw PH parallel to QG. The spectator, who imagines himself at rest, will, if he observes the star at these two epochs, see a difference of position corresponding to the angle HPF, at least if the distance of the star be not so great as to render that angle imperceptible to his instruments. This, however, will take place in the plane passing through the star and PQ, whereas the effect of aberration takes place in a plane perpendicular to that plane. Picard, Hook, and Flamsteed had all observed slight changes in the position of the stars; but seeing that they were in a direction different from that which would have been caused by the earth's motion only, they do not appear to have advanced any other explanation. In 1725, Bradley, Savilian Professor of Astronomy at Oxford, and afterwards Astronomer Royal, and Molyneux, the son of Locke's well-known friend of that name, set about this question conjointly. The most correct instrument for measuring very small angles was, at that time, the zenith sector [see ZENITH SECTOR], and a very large one, having a telescope twenty-four feet long, made by Graham, one of the most celebrated artists this country has produced, was erected at Kew, under the directions of Molyneux. A zenith sector measures the angular distance from the zenith, at which a star passes the meridian, the zenith being determined by a plumb line. The instrument having a very small range, the star must not be far from the zenith, and the one chosen on this occasion was γ Draconis, which happens to be within about 16° of the pole of the ecliptic, and passes very near the zenith of London. This star will, from the preceding account of aberration, appear to describe nearly a small circle about the place it would have if the earth had no motion, which is called its *mean place*. In the maps of the stars, published by the Society, the little circle, which represents γ Draconis, will do well enough to give an idea of the path which it describes every year. By measuring the star's zenith distance when on the meridian, its *polar* distance was also measured, since the zenith and pole are both points of the meridian, distant from one another by the *colatitude* of the place. [See COMPLEMENT.] That is, by adding the difference between 90° and the latitude of Kew to the meridional zenith distance of the star at that place, we obtain its polar distance. In *fig*. 4, S represents the mean place of the star, and *vsaw* the small ellipse, nearly a circle, described by the star in one year. The reader must imagine this circle placed in the heavens, and the line PS bent over his head, so that Z is his zenith and P the pole. We must now show how to find the points of the ellipse *vsaw*, answering to the four principal periods of the year—namely, the solstices and equinoxes. Referring back to *fig*. 3, in which we finally placed the spectator at S, the sun will appear to describe the circle which the earth really describes; that is, as the earth moves from Q to R, the sun will appear to move from P to T. Hence, when the earth is at Q, the aberration, throwing the apparent place of the star towards SR, 90° *before* the earth, throws it also towards a line 90° *behind* the sun's *apparent* place. Let E, *fig*. 5, be the earth, WVSA the apparent course of the sun or the ecliptic, EP the axis of the earth, AMVN the equator; whence, if the sun move in the direction indicated by the arrows, V is the vernal equinox, S the summer solstice, A the autumnal equinox, and W the winter solstice. The circle which bounds the whole figure is the *solsticial colure*, and as the star γ Draconis is very nearly on that colure, we will suppose it to be at S. Let Z be the spectator's zenith, that is, let him be on such a part of the earth that the plumb line falls in the direction ZE, the point Z will, by the motion of the earth, be carried round the dotted circle. The meridian is the moving circle passing through P and Z, and as the figure stands, the real star and the pole of the ecliptic are on the meridian. First, let the time be the vernal equinox, or let the sun appear at V; then the point W being 90° behind V, the star will appear to be thrown towards W, and its apparent place is *v*. Similarly, *s*, *a*, and *w* are the apparent places corresponding to S, A, and W, the dotted part of the ellipse being supposed to be bent over on the other side of the sphere. *Fig*. 4 is taken from *fig*. 5, and is the course of the star, as it will appear to the spectator at E, SQP being bent, so that Z is over his head, and P behind him. Let us now suppose him in the situation of Bradley, with an instrument capable only of measuring changes in the polar distance, the time being the winter solstice. As the star appears to move from *w* to *v*, which takes place between this and the vernal equinox, the polar distance will increase from day to day; after the vernal equinox it will decrease, and continue to do so until the autumnal equinox; after which, it will increase again till the winter solstice. This is precisely the phenomenon observed by Bradley, who at first suspected that it arose from some irregularity in the instrument, or deviation of the plumb line, and afterwards from some *nutation*, or conical motion of the earth's axis. These, however, he found would not account for the phenomenon. After setting up another instrument, and trying several other stars, it struck him, by what steps he has not told us, that the motion of light,

Fig. 4.

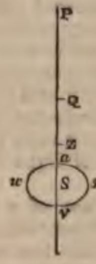
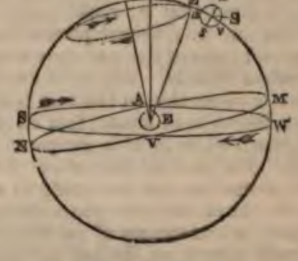


Fig. 5.

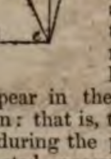


which had been previously discovered by observation of Jupiter's satellites, must, when combined with that of the earth, produce some variation in the apparent place of a star. Following up this idea, he found that it was fully sufficient to account for the deviation he had observed. We have previously explained why the idea of a parallax or change of place in a star, arising from the earth's change of place, did not withdraw his attention for a moment, though the hope of proving the sensible existence of such an irregularity was the primary motive of his observations.

The greatest aberration, as we have observed, is parallel to the ecliptic, and is the greatest semidiameter of the apparent annual ellipse of a star. This ought to be the same for all stars, if the rays which come from them move with the same velocity. Hitherto it has not been discovered that the greatest aberrations of different stars differ by more than may reasonably be imputed to instrumental errors; we must therefore conclude that, as far as we know, the light of every star moves with the same velocity. Bradley made the greatest aberration $20''$; others have deduced different values, varying from $20\frac{1}{4}''$ to $20\frac{7}{10}''$; but the result which appears most entitled to confidence, is that deduced by Mr. Richardson, Assistant Observer at the Royal Observatory, Greenwich, from more than four thousand observations, for which he received the gold medal of the Astronomical Society. He makes the aberration to be extremely near to $20\frac{1}{2}''$; which result is the more entitled to confidence, as it does not differ more than one-tenth of a second from the mean of all the results previously obtained.

It is well known that solar light is composed of several colours, which admit of separation from one another. The light of the stars is also compounded of several colours; for though different tinges predominate in different stars, no one gives a perfectly pure colour. The phenomenon of aberration proves that these different lights move with the same velocity; for two lights, moving with different velocities from the same star, would give different quantities of aberration; that is, would make differently coloured images of the star in different places, that image being nearest to the real place of the star, the colour of which moves with the greatest velocity. But as no indication of such an appearance is observable in the very best telescopes, we are, therefore, bound to conclude, that all the different coloured light of which white light is composed, moves with the same velocity. For the determination of the velocity of light from the aberration, see the article LIGHT.

We have hitherto considered only the case of a star which has no motion of its own; let us now take that of a planet, comet, or the moon, which moves while the earth moves. Let the planet move from A to *a*, and the earth from E to *e*, in the time which it takes the light to move from the planet to the earth. Then, by what has been said, the earth at *e* receives the ray A*e*, which is imagined to be in the direction B*e*; and if the planet had remained fixed at A, A*e*B would have been the aberration, or the angle contained between its true and its apparent direction. But in the meanwhile the planet has moved to *a*, and if light were transmitted instantaneously, would appear in the direction *ea*. Hence *ae*B is the aberration: that is, to the former angle, the planet's motion round *e*, during the passage of the light, must be added or subtracted, according as the earth and planet move in the contrary or same directions. The greatest aberration of Mercury is nearly one minute; that of the moon only two-thirds of a second. To the sun, which has no motion of its own, the rule for a star in the ecliptic may be applied; recollecting, however, that as a line drawn from the sun to the earth is always at right angles, or very nearly so, to the direction of the earth's motion, the aberration is always at its greatest value, or nearly so, and is nearly $20\frac{1}{2}''$.



In the preceding account we have omitted two circumstances, which would only have perplexed the reader: firstly, every star changes its place on account of the precession of the equinoxes. [See PRECESSION.] This was known to Bradley, who was, therefore, obliged to allow for this change, before he could pretend to assign that arising from any other phenomenon; secondly, the motion of the earth not being perfectly circular, but slightly elliptical, the quantity of aberration must be a little modified on that account. The effect of this will be seen in the article REDUCTION.

ABERRATION, in Optics. The most perfect mirror, or lens, which could be made, would be one in which all the rays which come from one point should be reflected or refracted to another point. Owing to the practical difficulties in the way of forming such a mirror or lens, the spherical form is adopted, of which it can only be said, that instead of returning to a point all the rays coming from a point, it condenses so many of them near a particular point, that an apparent image is formed at that point. The point near which most rays are collected is called the focus, and the distance at which a ray cuts any line passing through the focus is called its aberration with respect to that line. For a discussion of this subject, see LENS. Again, when light is refracted through any transparent medium, its different colours have different foci; for the cause and phenomena of which see ACHROMATIC. The aberrations arising from these two causes are generally known by the names of *spherical aberration* and *chromatic aberration*.

ABERYSTWITH, a town on the coast of Cardiganshire, in South Wales, near the outlet of the joint streams of the Ystwith and Rheidiol, over the latter of which rivers, above their junction, is a neat stone bridge. It was formerly defended by walls and by a castle, but these are now in ruins. The streets are narrow and ill paved, and the houses covered with the black slate of the country. It is a busy place; and in addition to its commerce, and its fisheries of cod, whiting, herring, and mackarel, some woollen manufactures are carried on, and small vessels built. Its exports are woollen goods, calamine, lead ore, and pig lead; its imports, coal, iron, and the articles of ordinary consumption. It has also become of late a place of resort for sea-bathing. The harbour is inconsiderable, and a bar keeps out vessels of much size. The vessels belonging to the port amounted, in 1829, (according to a Parliamentary Return) to 120, with a tonnage of 6423. Charles I. established a mint here for coining silver, chiefly for the payment of the neighbouring miners· the money was stamped on both sides with the feathers, to show that it was coined in Wales. It has a national school. Population, in 1831, 4128. Aberystwith, in conjunction with Cardigan, Lampeter, and Adpar, returns one member to Parliament. Aberystwith is 39 miles N. E. of Cardigan, and 208 W.N.W. of London. Lat. 52° 24′ N., long. 4° 5′ W.

ABETTOR. The etymology of this word is somewhat uncertain; it may be derived from the Saxon *betan*, to push forward, or incite. An abettor is an instigator or setter on—one that procures another to commit a crime. If an abettor, or, as he is then usually termed, aider and abettor, be present at the time of committing the crime, he is treated as a principal; if absent, he becomes an accessary before the fact. [See ACCESSARIES.] It is to be observed, that the presence spoken of is not necessarily an actual presence within sight or hearing of the fact, for there are circumstances of connexion with the principal actor which the law will construe into a presence, although, in fact, the party may have been absent, as in the case where one man commits a robbery or murder, while another keeps watch or guard at some convenient distance. Here the keeping watch is such a direct assistance in the commission of the crime as will amount to a *constructive* presence.

Aiders and abettors are distinguished from the absolute perpetrators of a crime by being denominated principals in the second degree, whilst the latter are called principals in the first degree. Formerly, the punishment of principals in the two degrees was, in most cases, different; but now, by the statute 7 and 8 George IV., cap. 29, principals in the first and second degrees, and accessaries before the fact, are all made liable to the same punishment.

ABEYANCE is a legal term derived from the French *bayer*, to expect. It is used with reference to a freehold or an inheritance; and the expression that the freehold or inheritance is in abeyance, imports that such freehold or inheritance is not vested in any one, but is in expectation and suspense, ready to descend upon, and vest in the parties (if any such there be), who shall first fill the character required by the particular quality of the estate. This suspense of the freehold or inheritance, especially of the former, is so repugnant to the general principles of the laws which regulate the tenure of land in England, that it is not allowed except where it is unavoidable. By the old law of this country, it was always necessary that some person should be in existence, as the representative of the fee or freehold for the discharge of the feudal duties, and to answer the actions which might be brought for the fief; and by this means the maxim arose that the freehold of lands could never be in abeyance. Still it was always admitted that both the inheritance and the freehold might, in some cases, be in abeyance. Thus, in the case of glebe lands belonging to parsons, and of lands held by bishops and other corporations sole, the *inheritance* is and must always be in abeyance, as no one can, under any circumstances, be entitled to more than an estate for life in these lands; and during a vacancy of the church, the freehold is in abeyance; for, no parson being actually appointed, it cannot possibly reside in any one, nor can the freehold be in the patron, who, though he possesses a right to present to the benefice, has no direct interest in the land annexed to it.

In this case, the law acknowledges a necessity that the freehold or inheritance should for a time be in suspense or in abeyance, but such an abeyance is always discouraged as much as possible, and is never permitted by the law to be *created* by the voluntary acts of parties. Therefore if a man grant land in such a manner that the *freehold* would, if the deed were allowed to operate, be in abeyance, the law comes forward and declares the deed granting such an estate to be void; and if the grant be so framed that the *inheritance* would be in abeyance, the law declares that the inheritance shall remain in the person making the conveyance. The object of this rule of law is to prevent the possibility of the freehold subsisting for a time without an owner, an evil which it guards against with the greatest vigilance; and therefore, if, as in the case last put, land is so granted that by possibility upon the death of one person there may be no one otherwise entitled to take immediate possession, the law appoints the grantor to supply the gap, if any should occur; and though he had, as he considered and intended, parted with all his interest, another rule of law, which will be more fully considered in treating of *contingent remainders*, then steps in and gives him the land for ever. Titles of Honour are also sometimes said to be in abeyance, as where the persons next in inheritance, to the last possessor, are several females, or co-parceners. In this case the title is not extinct but is in abeyance; and may be revived at any time at the nomination of the king, who by his prerogative is said to be the fountain of honours and dignities. Several instances of the exercise of this prerogative are on record both in ancient and modern times. [See 'Coke upon Littleton' 165, *a* notes 16, 17.]

ABIB, the first month of the Hebrew year, now more generally known by the Chaldee name Nisan. This month is first mentioned by name in Exodus xiii. 4. 'This day came ye out in the month of Abib;' and in the second verse of the preceding chapter it is appointed to be the beginning of the year.

On the 14th of this month, in the evening, the great festival of the Passover commences, according to the precept in Exodus xii. 18. 'In the first month, on the fourteenth day of the month, at even, ye shall eat unleavened bread,' &c. At sunset the paschal lamb is killed, the use of unleavened bread begins, and all servile labour ceases. A sheaf of barley was gathered on the evening of the 15th, and offered up on the 16th as the first fruits of the harvest. The reaping commences the next day. The eating of unleavened bread finishes on the 21st.

In the calendar of the modern Jews, Abib is no longer the beginning of the year, its place being usurped by Tisri, which was anciently the seventh month. Abib contains thirty days, and must not begin on Monday, Wednesday, or Friday. In those cases where the beginning would fall regularly on one of those days, the occurrence is obviated by adding or taking away a day of the preceding year.

The fast of the death of Joshua is celebrated on the 26th day of the month, unless it should happen to be Sabbath, when the fast is postponed to the day following, or Sunday.

This month begins on the first appearance of the new moon nearest the vernal equinox, or the 21st of March. In 1833 the first of Abib will be on the 21st of March, on which day the new moon falls.

The word Abib signifies 'an ear of corn;' and the month, without doubt, received its name from the season in which it occurred, as the corn was then in ear in Egypt and Palestine.

Abib is the name given by the modern Coptic Christians to their month which begins on the 25th of June. The Coptic name is Epip.

ABIES, in Botany (the Fir), a genus of trees of the coniferous tribe, well-known for the valuable timber that is produced by many of the species. It was formerly considered a part of the genus Pinus itself; but modern botanists have followed the popular practice, and have distinguished it. The origin of the Latin name is unknown: that of the English appellation is the Saxon *furh-wudu*, fir-wood.

GENERIC CHARACTER.

Flowers monœcious.*

MALES. *Catkins* simple, solitary, terminal, or axillary. *Stamens* obtuse, and often callous at the apex, terminated by a jagged membrane.

FEMALES. *Catkins* somewhat cylindrical; their *scales* two-flowered, imbricated, and having frequently at their base externally a *bractea*, which is either very short or lengthened beyond the scales themselves, and terminated by a taper point.

CONES more or less cylindrical; the *scales* imbricated and woody, but not thickened at the extremity; *seeds* ending in a membranous wing.

Embryo about the length of the seed, with several closely-packed cotyledons.

Trees of various sizes, usually with a straight, conical, undivided trunk, from which proceed spreading, horizontal, or drooping branches, arranged in a pyramidal manner. *Leaves* either solitary, or collected in little fascicles, deciduous or evergreen.

From Pinus, or the pine-tree, the fir is obviously distinguished by its more pyramidal form, and by its leaves arising singly from around the stem, not by twos, or threes, or a greater number, from out of a membranous shrivelling sheath, as well as by the characters in the fructification above described. Its species form four very natural tribes, of the first of which, the silver fir may be taken as the representative; of the second, the Norway spruce; of the third, the larch; and of the fourth, the cedar of Lebanon. As most of these are interesting either for the excellence of their wood or as objects of ornament, we shall briefly notice all that are at present known. Those who wish for further information should consult *Mr. Lambert's Monograph of the Genus Pinus—L. C. Richard's Mémoire sur les Conifères—Michaux's Histoire des Arbres Forestiers de l'Amérique Septentrionale, &c.*

SECT. I. Leaves growing singly round the branches, and all turned towards one side.—SILVERS.

No. 1. *Abies Picea*, the Silver Fir (Abies pectinata, *De Candolle Fl. Franç.*, ii. 275; Pinus Picea, *Linnæus Sp. pl.* 1420; *Lambert*, t. 40). Leaves arranged like the teeth of a comb somewhat emarginate, of a whitish colour underneath. Cones erect, with very blunt closely-pressed scales, which

[Silver Fir.]

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* In the article ABIES, and in subsequent articles of a similar description, it will be necessary to use some technical words which may present a difficulty to the reader who is unacquainted with the terms of Botany. As few of such words as possible will be employed; and a complete Glossary of them will be given under the article BOTANY.

are much shorter than the taper-pointed inflexed bracteæ. A native of the mountains of the middle and south of Europe, in stony, dry, exposed situations. Its favourite district seems to be on the Pollino and in the forest of Rubia, in the kingdom of Naples, where it is found in all its grandeur, often growing from 130 to 150 feet in height, and richly meriting the name *pulcherrima* (most beautiful), applied to it by Virgil. This tree is readily known by its leaves having their points all turned towards the sky, and being mealy underneath, as well as by its long, erect, stalkless cones, of a greenish-purple colour, bristling with reflexed taper points of the bracteæ that subtend the scales. It is the *sapin* of the French. Planks of indifferent quality, on account of their softness, are sawn from its trunk, which also yields Burgundy pitch and Strasburgh turpentine. For its successful cultivation in this country it requires strong land, such as will suit the oak, and a sheltered situation; it will then become a very large tree. From a communication to Mr. Lambert, it appears that trees have been felled which, at 100 years of age, contained six loads, or 240 cubic feet, of timber. It is said by some to grow slowly for the first fifteen years, but afterwards with great rapidity. A plant in Woburn Park is recorded to have grown for 110 years at the rate of one foot in height and nearly three and a half cubic feet per annum. Its trunk sometimes arrives at 150 feet in height, and six feet in diameter.

Antiquarians, not considering that this plant is the real *abies pulcherrima* of Virgil, and of the Roman authors, have lost themselves in vain attempts to reconcile the declaration of Cæsar (v. 12), that he found in Britain all the trees of Gaul, except the beech and abies, with the well-known fact that fir-wood is abundant in our ancient mosses, and has been met with even beneath the foundations of Roman roads. What Cæsar meant was, no doubt, that he did not meet with the silver fir in Britain; of the pine he says nothing, and therefore it is to be presumed that he found it.

No. 2. *Abies Sibirica*, the Siberian Silver Fir (Pinus Sibirica *and* Pinus Pichta *of the gardens*). Scarcely anything certain has been published of this tree, which, according to Linnæus, Mr. Lambert, and others, is the same as the Abies picea, our No. 1, but which Russian botanists distinguish as a particular species. Gmelin describes it as a native of all parts of Siberia as far as 58° N. lat. in mountainous regions, especially in the upper country lying between the Irtisch and the Ob, where it forms dense woods. The Russians call it *pichta*, or *fir*.

No. 3. *Abies grandis*, Great Californian Fir (Pinus grandis, *Douglas* and *Lambert*). Leaves long, narrow, very blunt, whitish beneath, all turned one way. Cones oblong, erect, rather curved, with very broad, uneven, downy scales, which are longer than the bracteæ.—Found, by Mr. Douglas, in low, moist valleys in northern California, where it attains the height of 200 feet. The wood is soft, white, and of inferior quality. Cones from three to four inches long; bracteæ very short, jagged, two-lobed, with a short intermediate point.

No. 4. *Abies Balsamea*, the Balm of Gilead Fir (Abies Balsamifera, *Michaux*, *Hist.*, vol. i. p. 145, tab. 14; Pinus Balsamea, *Lambert*, t. 41). Leaves flat, silvery-white beneath, either emarginate or entire at the point, all curved towards the upper side. Cones cylindrical, oblong, erect, purple, with rounded, even, undivided scales.—Found, along with *Abies nigra* and *alba*, in the coldest parts of North America, but always in detached individuals, never in large masses. It extends also along the ridge of the Alleghanies as far as the crests of the mountains of North Carolina. It forms a small slender tree, rarely more than forty feet high, with a diameter of from twelve to fifteen inches. The cones are four or five inches long, and about an inch in diameter. Its wood is light, of a pale yellow colour, and but slightly resinous; it is of little value, and is chiefly split up into staves for fish-barrels, for which, however, it is less fit than the Weymouth pine and the red variety of the black spruce fir. The English name has been given in consequence of a resemblance between the clear, transparent greenish-yellow turpentine, which is obtained from numerous cysts in its bark, and the Balm of Gilead of the shops; it is commonly known under the name of *Canadian balsam*. In England this is a small tree of very ornamental appearance, when young, on the skirts of plantations, but it rarely acquires any considerable size. The finest plants are said to be at Longleat, the seat of the Marquess of Bath.

No. 5. *Abies nobilis*, Large-bracted Fir (Pinus nobilis, *Douglas* and *Lambert*). Leaves very numerous, falcate, all turned one way, of nearly the same colour on both sides. Cones oblong, erect, with rounded broad scales concealed by the long wedge-shaped two-lobed jagged scales, which are bent back, and terminate abruptly in a rigid elongated point. A majestic tree, forming vast forests upon the mountains of northern California, where it was found by Mr. Douglas. The timber is said to be of excellent quality. The cones are about six inches long.

No. 6. *Abies Frazeri*, the Double Balsam Fir (Pinus Frazeri, *Pursh*, *Flor. Amer. Sept.*, 2639; *Lamb.*, vol. i., t. 42). 'Leaves linear, emarginate, silvery-white beneath. Cones oblong, squarrose. Bracteæ somewhat leafy, inversely cordate, mucronate, reflexed.' *Lambert.*—A native of the mountains of Carolina and Pennsylvania. Pursh is the only botanist who appears to have seen this species in its native situations. According to Mr. Lambert it is little more than a shrub, seldom exceeding ten feet, and more frequently, at least in this country, much under that height. That botanist considers it well suited for lawns and pleasure-grounds in situations where it is wanted to break particular lines, but not to interrupt the view. A fine specimen exists in the nursery of Mr. Lee, at Hammersmith.

No. 7. *Abies Webbiana*, Webb's Fir (Pinus Webbiana, *Wallich. Cat.*; *Lambert*, t. 44; Pinus spectabilis, *Lambert*). Leaves linear, solitary, flat, all-spreading, and turned one way, silvery-white beneath, with a deep notch at the extremity. Cones oblong, erect, obtuse, with very broad, rounded, even scales. According to the account of Captain Webb, who first discovered it, this remarkable species attains the height of eighty or ninety feet, with a diameter near the ground of three or four feet. Its wood seems to be valuable; in India it is used by plane-makers. From what has been reported of its general appearance, it is probably one of the most interesting species that has yet been discovered. Inhabiting the colder regions of northern India, and found among a flora that is more Siberian in its character than Indian, there can be no reasonable doubt of its being well able to withstand the rigor of the winters of this country. Plants that have been obtained for our gardens, within the last few years, have an air of health and robust strength that promises most favourably for its introduction as a common forest-tree. They are, however, like the Norway spruce, and many others, not adapted to bear frost after they have once begun to grow. High and dry stations, where the late frosts of spring are little felt, would, it is to be presumed, be the most eligible for experiments upon its naturalization. The natives call it *oumur*, and extract an indigo or purple pigment from the cones, which are represented in Indian drawings as strikingly beautiful.

No. 8. *Abies Canadensis*, the Hemlock Spruce Fir (*Michaux*, *Histoire*, vol. i., p. 137, t. 13; Pinus Canadensis, *Lambert*, t. 45). Leaves flat, arranged irregularly in two rows; when young, downy as well as the young slender branches. Cones very small, ovate, sharp pointed, with rather acute, even, entire scales: seeds very small.—The most northerly situation in which this tree is found is about Hudson's Bay, in lat. 51°. Near Quebec it forms extensive forests; in Nova Scotia, New Brunswick, Vermont, and the upper part of New Hampshire, it is extremely common; but in the middle and southern states it is confined to the Alleghanies and their dependent ridges, where it inhabits the sides of torrents and the bleakest situations. It is a noble species, rising to the height .of seventy or eighty feet, and measuring from two to three feet in diameter. It appears to be of slow growth, not arriving at its full dimensions in less than 200 years. When from twenty-five to thirty feet high its form is exceedingly elegant, but when old its huge limbs are apt to be rent and broken by winds and snow; and their naked stumps sticking out beyond the young and verdant foliage, give the trees an air of decrepitude and decay. The wood is of little value, being neither sound nor durable: it is chiefly employed for the manufacture of laths and for coarse in-door work. The bark is exceedingly valuable for tanning; mixed with oak-bark, it is said to be much better than oak-bark alone. It bears clipping well, and is therefore adapted, like the yew, to the construction of live-fences. A great deal of the essence of spruce is extracted from its shoots.

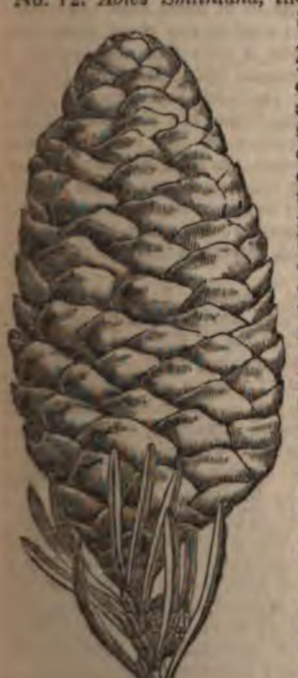
No. 9. *Abies Brunoniana*, the Deciduous Silver Fir (Pinus Brunoniana, *Wallich. Plant. As. rarior.* vol. iii. p. 24, tab. 247; P. dumosa, *Lambert*, t. 46). Leaves flat, all turned one

way, serrulate towards the points, covered beneath with a milk-white bloom. Cones terminal, erect, ovate, blunt, very small, with lax, ovate, very blunt scales.—Found in the northern parts of India in the provinces of Nepal, Butan, and Gossain Than, where it is known by the names *tangshing* and *changathasi-dhup*. A tree seventy or eighty feet high, with a clear trunk of from fifteen to twenty feet, and a spreading, very branchy head. Leaves about an inch long, falling off at a very early period, and so exceedingly deciduous, that the slightest shake of the branch is sufficient to detach them; very bright green, and shining. Cone not above an inch long, pale brown, nearly smooth, with several minute scales at its base; the scales ovate and very obtuse, subtended by a short kidney-shaped bractea. Seeds very small. The wood is of bad quality, being liable to warp, on which account it is not employed.

No. 10. *Abies religiosa*, the Sacred Mexican Fir (*Schlecthend. in Linnæa*, v. 77; Pinus religiosa, *Humboldt* and *Kunth*, *Nov. gen. et sp. pl.* vol. ii. p. 5; *Lambert*, t. 43). Young branches quite smooth. Leaves arranged in two rows, sharp pointed, covered beneath with a glaucous bloom.—Found by Humboldt on the lower hills of Mexico, between Masatla and Chilpantzingo, at an elevation of 4000 feet. Deppe and Schiede found it upon the cold mountains of Orizaba, at the highest limit of arborescent vegetation. It is described as a lofty tree, resembling Abies picea and balsamea, from which it is distinguished by its sharp-pointed leaves. The flowers are unknown. The branches are used for adorning the churches in Mexico. According to Mr. Lambert, the cones are like those of the cedar of Lebanon, but smaller, and almost black. The Mexicans call it *oyamel*. From specimens brought by Mr. Graham from Mexico, we should suppose this to be a very beautiful tree; the leaves are longer, and the branches more slender than those of any other of the Silver tribe.

No. 11. *Abies hirtella*, the Hairy Fir (Pinus hirtella, *Humboldt* and *Kunth*, *Nov. gen. et sp.* pl. ii. p. 5). Young branches covered with hairs. Leaves arranged in two rows, flat, acute, covered with glaucous bloom beneath.—Known only from the incomplete account of Humboldt, who found it on the mountains of Mexico near El Guarda, between Guchilaque and the city of Mexico, growing at an elevation of between 8000 and 9000 feet. He describes it as a small tree, three or four times as high as a man. Its cones and flowers are wholly unknown. The leaves are about an inch and a quarter long.

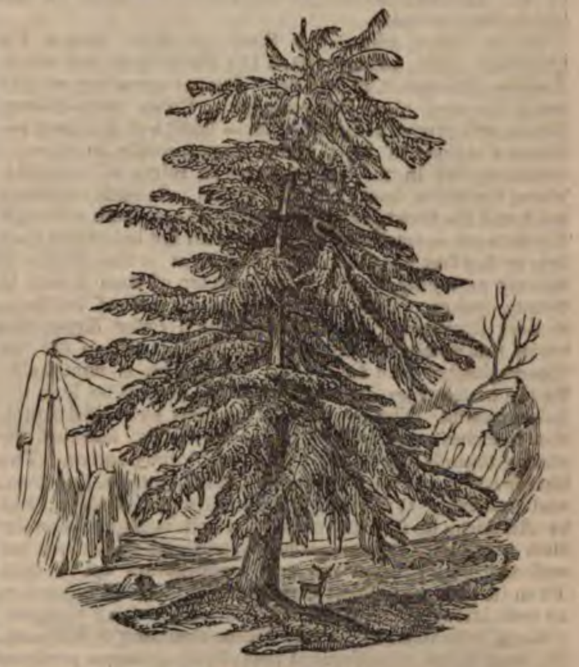
No. 12. *Abies Smithiana*, the Indian Silver Fir (Pinus Smithiana, *Wallich. Plant. As. rarior.*, vol. iii. p. 24, t. 246). Leaves slender, four-cornered, whitish beneath, a little turned towards one side. Cones erect, ovate-oblong, with obovate, rounded, even scales.—A native of the mountains next the Himalayeh, where it is called by the natives *raga*. A tree of enormous size, with nearly opposite branches, covered with short down, and so arranged as to form generally two rows. Leaves dark green, from an inch to an inch and a half in length. Cones from four to six inches long, brown, very even, and covered with a glaucous bloom. Seeds small. Nothing more is known of this plant, which is only described in Dr. Wallich's work above quoted.



[Cone of the Indian Silver Fir.]

SECT. II. Leaves growing singly round the branches, and all spreading equally.—SPRUCES.

No. 1. *Abies excelsa*, the Norway Spruce Fir (*DeCand. Fl. Franç.*, 3.275; Pinus abies, *Linn. sp. pl.* 1421). Leaves scattered, somewhat four-cornered, mucronate. Cones cylindrical, pendulous, with blunt, wavy, slightly-toothed scales.—Native of the mountainous parts of the north of Europe, where it sometimes constitutes, as in Norway, the principal timber. It is found all over Siberia as high as 70° N. lat.; in that region it is considered by the wandering tribes a certain sign of the presence of springs of fresh water, for it is only seen in moist and springy places; a property transferred to Abies picea by the late Sir James Smith, who has most strangely misapplied the statement of the Russian botanist Gmelin. When growing singly in rich soil, separate from other trees, this forms one of the most beautiful objects that can be imagined, with its long, drooping branches touching the very ground, and its regularly pyramidal figure; but in other situations, in plantations where the trees are crowded and deprived of their lower branches by want of light and air, it becomes, after nine or ten years, an inelegant plant of little value except to be cut for poles. When in perfection, and occasionally it arrives at its greatest perfection in this country, it acquires a stature of 150 feet; its wood is of a white colour, of a fine even grain, and very durable: in the market it is known under the name of white or Christiania deal. In Norway it arrives at maturity in seventy or eighty years. Trees of such an age are what are usually cut down for exportation, and each yields on an average three pieces of timber, eleven or twelve feet long. The spruce is readily known by its leaves of one uniform dull green colour, spread equally round the branches, and by its long pendant cones.



[Norway Spruce Fir.]

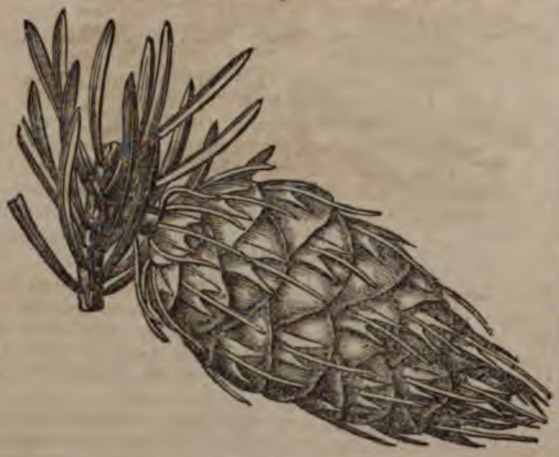
No. 2. *Abies orientalis*, the Oriental Fir (Pinus orientalis, *Linn. sp. pl.* 1421; *Lambert*, t. 39). Leaves very short, uniformly imbricated, quadrangular, with a callous point. Cones ovate, cylindrical, pendulous, their scales somewhat rhomboid. To botanists this is known chiefly by a figure published by Mr. Lambert after a drawing by Aubriet, the celebrated draughtsman, who accompanied Tournefort in his journey to the Levant. It was found by that traveller in the mountains south-east of Trebisond, above the convent of St. John. It has been subsequently met with by Russian botanists in the woods of Mingrelia, and near Teflis by Sir Gore Ouseley; but little has been added to our knowledge of the species. The young branches are said to be hairy. The leaves are very short and dense. The cones are small and pendulous, of an ovate, tapering figure.

No. 3. *Abies alba*, the White Spruce Fir (*Michaux, Hist.*, vol. i. p. 136, t. 12; Pinus alba, *Lambert*, t. 36). Leaves rather glaucous, spreading equally round the branches, four-cornered, somewhat pungent. Cones narrow, oval, tapering towards the point, with even, undivided scales. Found along with *Abies nigra* in the colder regions of North America; according to Michaux it does not advance so far to the northward as that species, from which it is known not only by its smaller size, the trunks rarely exceeding forty or fifty feet in height, but also by the bluish cast which characterizes the foliage, and which gives it a much lighter appearance than the sombre *abies nigra* Dr. Richardson, however, states that it was the most northerly tree observed in Franklin's Polar journey. The timber is of inferior quality. From the fibres of the root, macerated in water, the Canadians prepare the thread with which they sew together the birch-bark that forms their canoes. Its resin is also used to render the seams water-tight. Mr. Lambert appears to have been misinformed as to the essence of spruce being prepared from the branches of this species, which appears on the contrary from the statements of Michaux to be carefully rejected, because its leaves are thought to impart an unpleasant flavour. The bark is said to be occasionally used for tanning. Milton Abbey in Dorsetshire, and the grounds of the Earl of Tankerville at Walton, are named by Mr. Lambert as stations where fine specimens of this species may be seen.

No. 4. *Abies nigra*, the Black, or Red, Spruce Fir (*Michaux, Hist.*, vol. i. p. 125, t. 11; Pinus nigra *and* rubra, *Lambert Monogr.*, t. 37 and 38). Leaves spreading equally round the stem, short, four-cornered. Cones ovate-oblong, obtuse with ragged rounded scales.—Native of the most inclement regions of North America, especially in swampy situations and in the valleys between ridges of low hills, where the soil is deep black and humid. In such situations are found the finest forests of this species, and there, although the trees are so crowded together as often not to be more than four or five feet apart, the timber arrives at the height of seventy or eighty feet, with a diameter of from fifteen to twenty inches. The firs in the landscapes of northern scenery illustrating Captain Franklin's *Polar Expedition* are of this species, which, however, Dr. Richardson did not observe higher than 65° N. lat. The trunk is remarkable for the perfect regularity with which it diminishes from the base upwards. The head is of a regularly pyramidal figure, the branches spreading almost horizontally, and not inclining towards the earth, as in the Norway spruce. The timber is of great value on account of its strength, lightness, and elasticity. It is employed for the yards of ships; and in America, in districts where the oak is scarce, also for their knees: floors are occasionally laid with it, but it is not well adapted for this usage, as the planks are apt to split. From its young branches is extracted the *essence of spruce*, so well known as a useful antiscorbutic in long voyages; and not from those of the Abies alba, according to Michaux. By some it has been thought that North America produces a red as well as a black spruce, the former being of better quality than the latter; but the researches of Michaux show that what differences exist are due exclusively to the influence of soil, and have no dependence upon specific peculiarities.

According to Mr. Lambert, the curious dwarf spruce, called *Pinus clanbrasiliana*, is probably a variety of abies nigra.

No. 5. *Abies Douglasii*, the Douglas Fir (Pinus taxifolia, *Lambert Monogr.*, No. 43; Pinus Douglasii, *Id.* t. 47 and 48). Leaves spreading equally, deep green, whitish beneath, obtuse. Cones cernuous, ovate-oblong, with rather uneven cartilaginous scales, much shorter than the bracteæ, which are three-toothed, the lateral teeth being membranous, with the intermediate ones much longer and more rigid.—According to Mr. Douglas, the discoverer of this gigantic species, it is found in immense forests in North-West America from 43° to 52° N. lat. The trunks vary from two to ten feet in diameter, and from 100 to 180 feet in height. Occasionally it arrives at still greater dimensions; there still exists, near Fort George, on the Colombia River a stump which, without the bark, and at three feet from the ground, measures forty eight feet in circumference. An evergreen tree, with an erect, taper trunk, which when old is covered with a rough, rugged bark from six to nine inches thick, abounding in a clear yellow resin, and making excellent fuel. The young branches have their bark filled with receptacles of resin, as in the balm of Gilead. The timber is heavy, firm, of as deep a colour as yew, with very few knots, and not in the least liable to warp. We have a plank now before us, which, after standing some years in a hot room, is as straight, and its grain as compact, as the first day it was planed. The growth is exceedingly rapid; we have seen a branch three inches in diameter which was not more than eight years old. The aspect of the young branches is so deep a green, that they seem as if they were more nearly of the nature of a yew than of a spruce. In the autumn their buds are very prominent and bright brown. The cones are remarkable for the long tridentate bractæ which stick out far beyond the scales themselves.



[Cone of Douglas Fir.]

A considerable number of plants of this important species are now scattered among the parks and woods of this country, some hundreds having been raised and distributed by the Horticultural Society. It appears to suit this climate perfectly, and to be likely to prove more valuable than even the larch itself, being evergreen, and fully as hardy.

No. 6. *Abies Menziesii*, the Menzies Fir (Pinus Menziesii, *Douglas, Lambert*). Leaves very short, rigid, rather sharp-pointed, whitish beneath, spreading regularly round the stem, very deciduous. Cones oblong, composed of very lax, ragged retuse, ovate, thin scales, much longer than the narrow, serrated, concealed bracteæ. Buds ovate, acute, covered with resin.—A native of Northern California, where it was found by Mr. Douglas, who describes the wood as being of excellent quality. The cones, which are about three inches long, are extremely different from those of any other species. The branches, deprived of their leaves, are covered with thin, hard, projecting bases, which give them a singularly tuberculated appearance.

SECT. III. Leaves growing in clusters; deciduous.—LARCHES.

By some botanists this section is considered essentially different from Abies; but the want of any clear, distinctive characters, either in the mode of growth or the organs of fructification, induces us to concur with Linnæus, Jussieu, and Richard, in considering the larch the same genus as the spruce. The leaves of the former are clustered or fasciculated, merely in consequence of the universal nondevelopment of lateral branches; so that the leaves themselves make their appearance without a perceptible central axis. This is proved not only in the cedar of Lebanon, but even in the larch itself, by numerous cases where the branches being less abortive than usual, lengthen enough to display their real nature.

No. 1. *Abies Larix*, the Common Larch Fir (*Rich. Monogr. Conif.* 164, t. 13; Pinus Larix, *Linn. sp. pl.* 1427, Larix Europæa, *De Cand. Fl. Franç.*, 3.277). Leaves clustered, deciduous. Cones ovate-oblong, blunt.—A native of the mountains of the middle of Europe, of Russia, and of Siberia. In the latter country it is the commonest of all trees, delighting in dry, elevated situations, where it forms vast forests, sparingly intermixed with pines. Its trunk grows very erect, with graceful drooping branches, gradually diminishing from the base to the apex, and giving it a regularly pyramidal form. In the spring, when its young leaves have just burst into life, it has a peculiar bright yellowish-green tint, which is possessed by no other tree of our forests. The larch has been now, for many years, extensively cultivated upon barren, exposed land, both in England and Scotland, and it has been found one of the most profitable of all trees to the planter, provided the land be well drained; but it will not succeed in swampy situations. It grows with great rapidity, is subject to very few accidents, transplants with but little risk, and produces timber of great excellence and value, not only for domestic but for naval purposes. In mountainous districts in Scotland the Duke of Athol has planted it in immense quantities; and it appears, from a report of that nobleman to the Horticultural Society, that in situations 1500 to 1600 feet above the level of the sea, he has felled trees, eighty years old, that have each yielded six loads of the finest timber. Three varieties are mentioned by botanical writers; of these the first is remarkable for the young cones being pale green instead of crimson; the second has a weeping habit: both these are natives of the Tyrol. The third sort is of a slow, stunted growth, and an inelegant appearance, leafing early, and very subject to injury from spring frosts; it was raised by the Duke of Athol from Archangel seeds.

[The Larch.]

From the boiled inner bark, mixed with rye-flour, and afterwards buried for a few hours in the snow, the hardy Siberian hunters prepare a sort of leaven, with which they supply the place of common leaven when the latter is destroyed, as it frequently is, by the intense cold to which hunters are exposed in the pursuit of game.

The bark of the larch is nearly as valuable to the tanner as oak-bark; it also produces the substance called Venice turpentine, which flows in abundance when the lower part of the trunk of old trees is wounded. A sort of manna, called Briançon manna, is exuded from its leaves in the form of a white flocculent substance, which finally becomes concreted into small lumps.

It is believed that this species was the *πίτυς* of the ancient Greeks. The origin of the more modern word *larix* is uncertain. By some it is derived from the Celtic *lar*, fat, in allusion to its unctuous, inflammable resin; by others from the Welsh *llär*, wide-spreading: it is, however, more likely to have been in some way connected with the word *l'aris*, which appears, from a very curious paper by Mr. Drummond Hay, read some time since to the Horticultural Society, to be the Berber name of a large coniferous tree found in Rif, or Er rif, and in all the higher sierras of Marocco.

No. 2. *Abies microcarpa*, the Red Larch Fir (Pinus microcarpa, *Lambert*, t. 50). Leaves clustered, deciduous. Cones oblong, small; their scales erect, close-pressed, the upper ones much smaller than the lower.—A graceful tree, with much of the habit of the common larch, from which its very small cones, of a bright purple in the summer, readily distinguish it.—A native of North America. This is by no means so well adapted to the planters' purposes as the common larch, growing very much smaller. According to the Duke of Athol, who cultivated this in his larch-plantations in Scotland, trees, when fifty years old, do not contain one-third as many cubic feet as the common larch. The wood is so heavy that it will scarcely swim in water.

No. 3. *Abies pendula*, the Black Larch Fir (Pinus pendula, *Lambert*, t. 49). Leaves clustered, deciduous. Cones oblong, with numerous spreading scales, which gradually diminish from the base to the apex of the cones. Branches weak and drooping.—A native of North America, where it is found growing in a rich clay soil, mixed with sand, in cold mountainous districts. When cultivated in this country it is an elegant tree, having a good deal of resemblance to the common larch, but being of a brighter green colour, and much more graceful. The leading shoot will often begin to droop at the height of fifteen or twenty feet from the ground, and, after gradually acquiring a horizontal direction, will bend towards the earth so as to form a natural arch of great beauty. The wood is less valuable than that of the common larch.

SECT. IV. Leaves growing in clusters; evergreen.—CEDARS.

No. 1. *Abies Cedrus*, the Cedar of Lebanon Fir (Pinus Cedrus, *Linnæus*, *Lambert*, t. 51). Leaves clustered, evergreen. Cones oblong, very obtuse, erect, with broad closely-packed scales, which are a little thickened at the margin.—Mount Lebanon and the range of Taurus are the native spots of this most stately and magnificent tree, which compensates for its want of height by its huge wide-spreading arms, each of which is almost a tree in itself. According to Labillardière, a French traveller in Syria, the largest of those now remaining on Lebanon is, at least, nine feet in diameter; the trees are held in great veneration, and a holiday is set apart for the *feast of cedars*. Its growth is far from being so slow as some imagine; on the contrary, the observations of those who have cultivated it with care prove that it will vie in rapidity of growth with almost any forest tree. It appears from Mr. Lysons' inquiries that there is a tree at Highclere, the seat of the Earl of Caernarvon, which, when fifty-eight years old, measured ten feet one inch in circumference at three feet from the ground. Cedar wood has the reputation of being indestructible: instances have been named of its having been taken from buildings uninjured after a lapse of two thousand years. Mr. Lambert, however, remarks, with justice, that 'in relation to these properties, there is much vulgar error and confusion, the cedar of Lebanon being often confounded with trees of different genera.' Mr. Lambert conjectures that the Cedrus of the Greeks was the wood of *Cupressus horizontalis*; Sprengel refers it to the *Juniperus oxycedrus*; but it appears highly probable, from some interesting observations made at Tangier by Mr. Drummond Hay, that the indestructible cedar wood was the beautiful, hard, deep-brown timber of Thuja articulata, the Sandarac tree (see THUJA). The wood of Abies cedrus produces deal of very indifferent quality.

[The Cedar of Lebanon.]

No. 2. *Abies Deodara*, the Sacred Indian Fir (Pinus Deodara, *Lambert*, t. 52). Leaves evergreen, in clusters, acute, triangular, stiff. Cones growing in pairs, stalked, oval, obtuse, erect; the scales closely packed, very broad, and nearly even at the margin.—A native of the mountains of India near the town of Rohilcund, on the alps of Nepal and Thibet, at a height of 10,000 or 12,000 feet, and also in the woods of Almorah. A large tree, with a trunk about four feet in diameter, resembling the cedar of Lebanon, from which it differs in having its cones upon stalks and its leaves longer and more distinctly three-sided, and also in the quality of its timber. According to Mr. Moorcroft, from whose notes, in Mr. Lambert's monograph of the genus, we borrow much of our information, the Hindoos call it the Devadara, or God tree, and hold it in a sort of veneration. Its wood is extremely durable, and so resinous that laths made of it are used for candles. Spars of it have been taken out of Indian temples, known to have been erected from 200 to 400 years, uninjured except in those parts which originally were sapwood. Mr. Moorcroft procured specimens from the starlings of the Zein ool Kuddul bridge, in Ladakh, where it had been exposed to the water for nearly 400 years. Mr. Lambert says that its wood takes an excellent polish, being very close-grained, and perhaps the most valuable of the genus. A few plants are now growing in the gardens of Great Britain, having been reared from seeds brought from India by the Hon. Mr. Melville: they are too young for us to judge of their suitableness to this climate, but there is every reason to believe that they will be as hardy as the now common cedar of Lebanon.

Two varieties, or perhaps nearly-related species, called the *Shinlik* and *Christa rooroo*, are mentioned by Moorcroft as natives of the forests of Ladakh.

To the species now enumerated, the following almost unknown kinds have to be added:—

No. 3. *Abies Kæmpferi* (Pinus Kæmpferi, *Lambert. Monogr.*, Preface, p. vii.; Pinus Larix, *Thunberg. Fl. Japon.*, p. 275). A native of Japan, found wild upon the mountains of Fako; called by the natives *Leosi*, or *Kara maats Nomi*, according to Kæmpfer.

No. 4. *Abies Thunbergii* (Pinus Thunbergii, *Lambert. Monogr.*, Preface, p. vii.; Pinus Abies, *Thunb. Fl. Japon.*, p. 275). A scarce plant in Japan, where it is found even in the city of Jeddo, according to Thunberg.

No. 5. *Abies Momi*, (Siebold in verhand. Bataav. genootsch. xii., p. 12.) Found in Japan, as well as the two following. Its wood is, according to Siebold, in great estimation on account of its whiteness and fine grain.

No. 6. *Abies Torano.* Id.

No. 7. *Abies Araragi.* Id. Wood brown; used for various domestic purposes.

The genus of resinous plants called Abies, which we have thus described, comprehend many forest trees of great importance; and it will be, therefore, proper to add a few remarks on their cultivation. Some of them, such as the larch, the Norway spruce, the silver fir, and the balm of Gilead, are raised in the nurseries annually in the open ground, in large quantities, for the supply of our plantations; others, such as the cedar of Lebanon and the Douglas fir, are procured in much less abundance, and are treated with more care, being usually kept in pots until they are finally committed to the earth in the situation they may be subsequently destined to occupy.

All the species are increased by seeds; they may also be propagated both by inarching and by cuttings; but it is found that plants so obtained are either very shortlived or stunted, unhealthy, and incapable of becoming vigorous trees. In some of the species, such as the balm of Gilead and the silver fir, the scales of the cones readily separate from their axis, so as to render the extraction of the seeds a simple and easy operation; but in others, such as the larch and the spruce, the scales will neither separate nor open. in such cases it is necessary to dry the cones as much as possible, then to split them by means of an instrument passed up their axis, and afterwards to thresh the portions so separated till the seeds can be sifted out.

Like other resinous seeds, these are perishable unless sown within a few months after the cones have been gathered; they will, however, keep much longer in the cone than if separated; wherefore, they should always be imported in that state.

It is usual in the nurseries to sow them in the spring in beds of light soil, in which no recent manure has been mixed: they are buried at various depths, according to the force of the vital energy of the species. This has been found by experience, as it is said, to be one inch for the silver fir; half an inch for the spruce, balm of Gilead, and cedar of Lebanon; a quarter of an inch for the larch; and less for the American spruce: it is, however, probable that these depths are of very little importance. In order to protect the surface of the beds from being dried while the young seeds are sprouting, it is generally overspread with a thin layer of long straw, which is removed as soon as the crop begins generally to appear. During the first season the seedlings remain undisturbed; the only attention they receive being to keep them free from weeds. In the following spring the young plants are taken up carefully, and their roots, being a little shortened, are imbedded in rows about six inches apart, where they remain for one or two years. After this they are transplanted into quarters, in rows a foot or nine inches apart, the plants being about six inches from each other. Having remained in this situation for a year, they are fit to be transferred to the plantation, or they may stand two years in the quarters, and then be taken up and replaced in a situation of the same kind, if circumstances should render such a proceeding desirable. On no account, however, should they be allowed to remain in the nursery quarters more than two years at a time without being taken out of the ground, because they are apt to form long and strong roots, which are destroyed in the process of transplantation, so that the life of many must be either materially injured or wholly sacrificed.

None of the firs should be transplanted at a height exceeding three feet, for the reason last mentioned; and the larch is the only kind that will remove advantageously even at this size. The spruce and its allied species may be removed more successfully when from a foot and a half to two feet high. To this there is no other exception than that of plants that have been constantly reared in pots, as the cedar of Lebanon; these may be safely removed at any size, if the transplantation is carefully attended to, because their roots are uninjured in the operation. It should, however, be remembered, in finally planting out large firs which have been always kept in pots, that it is absolutely necessary that their roots should be spread out among the earth as much as may be practicable without straining or breaking them; because, while in pots, they necessarily acquire a spiral direction, which they will not afterwards lose unless it is destroyed at the period of final transplantation; and, if they do not lose it, they are apt to be blown over by high winds, on account of their roots not having penetrated into the earth far enough in a horizontal direction to form the requisite stay to support the trunk and head.

Where great importance is attached to the raising the seeds of rare species of fir, it has been found a very beneficial practice to place them between two turfs placed root to root, the one upon the other, and to watch them till the seeds begin to sprout; they are then to be sown in the usual way, when every seed will usually succeed.

No trees are more impatient of pruning than these. They exude, when wounded, so large a quantity of their resinous sap as to become weakened even by a few incisions; and, if they have suffered many, they are long before they recover from the effects. So great is their symmetry, and so uniformly will their branches form under favourable circumstances, that it will rarely happen that a necessity for the use of the pruning-knife can arise. The great rule to be observed in their management is to allow them ample room for the extension of their branches; if this is attended to, their beauty is not only ensured, but the rate at which they will form their timber will be an ample recompense for the space they may occupy.

ABIES, in Fossil Botany, a name given by Adolphe Brongniart to a single incomplete specimen of a fruit resembling that of some spruce fir, but of which not even the locality is known. It is called *Abies laricioides*.

ABIETINEÆ, in Botany (*Richard. Monogr. Conif.* 145), a section of CONIFERÆ, or of the FIR TRIBE, comprehending Abies, Pinus, and the genera that have in modern days been struck off from those two. For its botanical characters see CONIFERÆ.

ABINGDON, one of the principal towns in Berkshire, and a place of great antiquity. Some have carried back its origin to the time of the Britons. It received its name of Abban dun, or Abben don, the town of the abbey, from the removal hither of a monastery previously fixed at Bagley

Wood in the neighbourhood. It was a place of considerable importance in the period of the Saxon Heptarchy; and Offa, King of Mercia, had a palace here. The abbey, which was founded in the twelfth century, flourished under the favour of successive princes; and its revenues, at the dissolution of religious houses, amounted to nearly 2000*l.* per annum. Henry I. was educated in it. The town is pleasantly situated at the junction of the Ock and the Thames, just above where the Wilts and Berks canal joins the latter. The streets are spacious, diverging from the market-place, and are well paved and lighted; the supply of water is also good. The market-house is an elegant structure of freestone, and in it is a spacious hall for transacting public business. The July and October sessions and the summer assizes are held here. Abingdon returns one member to Parliament. It has a separate jurisdiction, having obtained a charter of incorporation in the reign of Philip and Mary, A.D. 1557. There are two handsome churches, those of St. Helen and St. Nicholas; and meeting-houses for the Baptists, Independents, Quakers, and Wesleyan Methodists. There is a free grammar-school well endowed, a national and a British school, and some other foundations for the purposes of education. There are also many alms-houses, in the chief of which (Christ's Hospital) thirty-two poor women are supported. The trade of Abingdon consists of malting, hemp-dressing, and sack and sail cloth making; in the latter branch of manufacture there has been a considerable decline since the peace. The corn-market is large. Capacious wharfs and warehouses have been erected at the entry of the Wilts and Berks canal into the Thames. The population of the town was, in 1831, 5259. It is 26 miles N.W. by N. of Reading, and 56 W.N.W. of London. Lat. 51° 40′ N., long. 1° 16′ W.

ABIPONIANS, an aboriginal tribe of South America, who formerly occupied part of the province of Chaco, a country about 300 leagues long and 100 broad, lying about the centre of Paraguay, near the parallel of 28° south. The Mokoby, a powerful tribe, whose relationship to the Abiponians is proved by the resemblance of their language (see ADELUNG'S MITHRIDATES), still inhabit the interior of the province of Chaco, on the banks of the Vermejo and Ypita rivers, which are tributaries to the great Paraguay. The Abiponians, about the beginning of the last century, being defeated by the Mokoby, who were more numerous, placed themselves under the protection of the Spaniards; and finally, to escape from their vindictive enemies, the greater part of them went eastward in 1770, and crossing the Parana river, established the colony of Las Garzas. Here they have retained nearly all their original usages. There are three divisions of the Abipones: the Naquegtgaguehee, the Ruecahee, and the Jaconaiga. When Dobrizhoffer was acquainted with the Abiponians, they were chiefly in Chaco; he describes them as a well-made, tall, handsome race of men, with faces of the European form, and a complexion rather light coloured. Their bodies are robust, capable of enduring fatigue and all the changes of temperature. According to the Jesuit missionary Dobrizhoffer, our chief authority, they are the most wonderful people in the world. An Abiponian, almost a hundred years old, will leap on his horse as nimbly as a boy, and sit there for hours. His teeth and sight are unimpaired at this advanced age; a man who dies at eighty is considered to have come to an untimely end. However, the good missionary remarks that *all* the inhabitants of Paraguay are not quite so wonderful as the Abiponians, for the pedestrian nations are less long lived than the equestrian. One curious feature in the character of the Abiponians is their skill in horsemanship. The horse, as is well known, was introduced into South America by the Spaniards, and from them the Abiponians stole them. They soon became so expert in the management of this animal, that, issuing from their distant retreats, they crossed dry deserts, or extensive swamps, with equal ease and daring, and, after a journey of surprising rapidity, would fall on the Spaniards, when least expected, and massacre all before them. [See *Martin Dobrizhoffer's Account of the Abiponians*, London translation, 1822; Latin original, Vienna, 1784: also in German, 3 vols. 8vo.]

Dobrizhoffer went to South America in 1749, and stayed there eighteen years. His account of the Abiponians is exceedingly minute, and even tedious; and though it no doubt contains many curious and interesting facts, it is not possible to read it without a considerable portion of scepticism; indeed, we do not hesitate to say, that we disbelieve altogether many of the accounts which the good missionary gives: we need only refer to men one hundred years old jumping on horses. Compare Azara's short notice (vol. ii. p. 165) of the Abiponians of Las Garzas.

ABJURATION (*of the Realm*), in law, signifies a sworn banishment, or the taking of an oath to renounce and depart from the realm for ever. By the ancient common law of England, if a person guilty of any felony, excepting sacrilege, fled to a parish church, or churchyard, for sanctuary, he might, within forty days afterwards, go clothed in sackcloth before the coroner, confess the full particulars of his guilt, and take an oath to abjure the kingdom for ever, and not to return without the king's licence. Upon making his confession and taking this oath, he became *ipso facto* attainted of the felony; he had forty days from the day of his appearance before the coroner to prepare for his departure, and the coroner assigned him such port as he chose for his embarkation, to which he was bound to repair immediately with a cross in his hand, and to embark with all convenient speed. If he did not go immediately out of the kingdom, or if he afterwards returned into England without licence, he was condemned to be hanged, unless he happened to be a clerk, in which case he was allowed the benefit of clergy. This practice, which has obvious marks of a religious origin, was, by several regulations in the reign of Henry VIII., in a great measure discontinued, and at length by the statute 21 James I. c. 28., all privilege of sanctuary and abjuration consequent upon it were entirely abolished. In the reign of Queen Elizabeth, however, amongst other severities then enacted against Roman Catholics and Protestant Dissenters convicted of having refused to attend the divine service of the Church of England, they were by statute (35 Eliz. c. 1,) required to *abjure the realm* in open court, and if they refused to swear, or returned into England without licence after their departure, they were to be adjudged felons, and to suffer death without benefit of clergy. So that the punishment of abjuration inflicted by this Act of Parliament was far more severe than abjuration for felony at the common law; in the latter case, the felon had the benefit of clergy; in the former, it was expressly taken away. Protestant Dissenters are expressly exempted from this severe enactment by the Toleration Act; but Popish recusants convict were liable to be called upon to abjure the realm for their recusancy until a statute, passed in the 31 Geo. III. (1791), relieved them from that and many other penal restrictions upon their taking the Oaths of Allegiance and Abjuration.

ABJURATION (*Oath of*). This is an oath asserting the title of the present royal family to the crown of England. It is imposed by 13 Will. III. c. 6; 1 Geo. I. c. 13; and 6 Geo. III. c. 53. By this oath the juror recognises the right of the king under the Act of Settlement, engages to support him to the utmost of the juror's power, promises to disclose all traitorous conspiracies against him, and expressly disclaims any right to the crown of England by the descendants of the Pretender.

ABLANCOURT (PERROT NICOLAS D'), one of the most esteemed translators of the classic authors, in the seventeenth century, was born at Châlons sur Marne, in Champagne, (now in the department of the Marne,) in 1606, and died of the stone at Ablancourt in November, 1664; but not of voluntary starvation, on account of the pains of his disorder, as is said in the *Menagiana*. His family was honourable, and greatly esteemed at the bar. His father bestowed the most anxious care on his education, with the view of uniting the advantages of public and private education; and in this he succeeded, for his son advanced most rapidly in his classical studies. Ablancourt commenced his career at the bar, but quitted it almost immediately for literary pursuits; and at the same time abandoned the Protestant creed, in which he had been brought up, to the great delight of the Catholic members of his family. He returned, however, to his first belief; for six years afterwards, his conscience not being quite at rest, he studied with the deepest attention under the learned Stuart for three years, at the end of which time he abjured the Roman faith, and immediately after retired into Holland, to be near the learned Saumaise, and enjoy the society of that famous scholar; perhaps, also, to let the scandal of his second abjuration die away. It is only fair to state, that on neither occasion was he influenced by any worldly consideration whatever. From Holland he repaired to England, and from thence to Paris, where he became intimately acquainted with Patru, one of the most celebrated writers and distinguished lawyers of that day, and also with other eminent literary characters. In 1637, (the *Biograph. Univ.* says, by mistake, 1627, the Académie Françoise having been established only in 1634-35,) he was received a Member of the French Academy, and gave his whole attention to the translation of the works of Tacitus; but being soon obliged to quit Paris on account of the war which broke out, he went to reside at his seat at Ablancourt, in Champagne, for the remainder of his life, with the exception of the time he spent in Paris during the printing of his works. Ablancourt had so lively an imagination, that his friends wondered at his being only a translator; but his reason for being so was, according to his own account, that there were already too many modern works deficient in truth and novelty, in which princes could not learn their duties so well as in the ancient writers. D'Ablancourt might have quoted Mezerai and several others as exceptions to that remark. Of his numerous translations those most known are, the whole of Tacitus, of which there have been ten editions; four orations of Cicero; Cæsar; and the Wars of Alexander by Arrian, the most esteemed of his translations as regards the style only; Thucydides; the Anabasis of Xenophon; and an imitation, rather than a translation, of Lucian. As to the accuracy of the translations of Ablancourt, when compared with those of the last century, and still more with those of the present, they are decidedly inferior to both; and even during the life of the author, admired as he was, and destined to immortality according to the opinion of his friends and the public at large, they were denominated *belles infidèles*. They were intended for what is called the 'fashionable world;' and it was then the notion of that class that everything ought to be Gallicised; which is, in truth, the great fault of many branches of French literature in the seventeenth century.

D'Ablancourt entered so well into the taste of his readers that everything, even in geography, is modernised in his translations; as, for instance, Germany becomes Allemagne; Caledonia, Scotland; Britannia, England; the Batavians, Hollanders: and, in the Life of Agricola, the description of *Britain* is introduced in this manner—'*England* is the largest of the islands which are known by us; it has *Allemagne* to the orient, and to the occident *Spain*, and *France* to the south.'

Though this notice is not very long, we may perhaps have extended it beyond what this author deserves, considering his degree of merit; but Ablancourt, during his lifetime, was held in high estimation, which still prevails to a certain degree in France, and perhaps in England also. His life has been written by his friend, Patru. In 1662, Colbert proposed him to Louis XIV., as the historian of his reign, but Louis would not have a Protestant to commemorate the events of his reign. However, he did not deprive him of his pension of 120*l.* per annum, which had been granted to him as historiographer. The revocation of the Edict of Nantes had not yet been proclaimed.

ABLATIVE CASE, a term borrowed from the grammatical system of the Latin language, and occasionally employed in teaching our own. In the English language there are many little words, such as *with*, *in*, *to*, *at*, &c., which are called *prepositions*, because they are *preposed* or prefixed to the words with which they are connected. The name, however, is an unfortunate one, as they are sometimes found *postponed* or placed after such words, especially in the older specimens of our language. We say *with which* or *wherewith*, *in which* or *wherein*, *from which* or *wherefrom*. So, in the Latin language, a certain set of little words, with the force of prepositions, were tacked on to the end of their nouns: thus, while the three letters, *reg*, meant *king* (whence our word *reg-al*), *reg-is* meant *of* or *from a king*—*reg-i*, *with*, *in*, or *near a king*—*reg-em*, *to a king*. Thus the three little words, *is*, *i*, *em*, were equivalent to prepositions. It pleased the grammarians, however, who are fond of multiplying names, to call these words *reg-is*, *reg-i*, &c., by the name of *cases*. The meaning of the endings of these words was not always definite enough. Thus with the case in *i*, for instance, it was found necessary to mark the relation of place more precisely by the addition of other words, as *in*, *in*—*pro*, *before*—*cum*, *with*. Thus they would have, *in regi*, *in the king*; *pro regi*, *before the king*; *cum regi*, *with the king*. Now, as *in*, *pro*, *cum*, were much more definite than the termination *i*, it became unnecessary to make the *i* distinctly heard. It was no longer necessary to the meaning, and might, therefore, be slurred over: hence the pronunciation was reduced to *in rege* (the last *e* very faintly pronounced), *pro rege*, *cum rege*. It would seem as if the termination *is*, signifying *of*, or *from*, was treated in the same unceremonious manner, for we find *ex rege*, *out of the king*; *ab rege*, *from the king*; *de rege*, *down from the king*; where we might have expected *ex reg-is*, *ab regis*, *de regis*. But, as we said above, *ex*, *ab*, and *de*, being more precise in meaning than the little appendage *is*, the distinct pronunciation of the former rendered that of *is* superfluous, and consequently the little *is* dropped into a weak *e*, as before. Now this termination *e*, affixed to the Latin nouns, received from the grammarians the name of *ablative case*, i.e. the *case* of *removal*; which applies, indeed, well enough to *ex rege*, *out of the king*; *ab rege*, *from the king*, &c.; but is not well suited to the ideas, *cum rege*, *with the king*; *in rege*, *in the king*, &c. But the grammarians who invented these hard names seldom saw more than half of the question before them. For fear, lastly, that any of the learned should find fault with our Latin, we will observe that even the little *e* which marks the ablative case, which *e* itself is but a remnant of a longer termination, was often absorbed by a preceding vowel in the Latin word to which it was attached. Thus, to take *regina*, *a queen*, they did not say *in reginae*, *cum reginae*, *ex reginae*, &c., but *in regina*, *cum regina*, *ex regina*, &c. When the term 'ablative case' is used in English grammar, it is only an awkward name for the preposition *from*.

ABLUTION, literally *a washing away*—a religious ceremony, consisting in bathing the body, or a part of it, in water, which has been practised more or less extensively by the disciples of almost every form of faith. In the earlier and ruder states of society especially, there is a strong tendency to endeavour to invest the spiritualities of religion with what we may call a visible and substantial form, so that they may be apprehended not only by the reason, but also by the senses. Of this disposition the master minds who have founded and reared the various systems of superstition that have held sway in different countries and ages of the world, have usually taken advantage, as a chief instrument whereby to work upon the gross natures to which they had to address themselves, and to intwine the desired belief at once with their affections and with their habits. Among such outward types, none can be conceived more natural or appropriate than that of washing the body with water as a sign or attempted representation of mental purity. The custom, particularly in the warm climates where it was first introduced, had also the further advantage of being highly conducive to health; and this circumstance no doubt contributed powerfully to recommend it to the authors of many of the religions by which it was sanctioned and enjoined. Ablutions, or lustrations, as they are more commonly called, even constituted a part of the Mosaic ceremonial, and were practised among the Jews on various occasions both by the priests and by the people. They occupy an important place in the Brahminical and other religions of India, where the waters of the Ganges are considered as having so purifying a power, that even if a votary, who cannot go to that river, shall call upon it to cleanse him, in prayer, while bathing in another stream, he will be freed from any sin or pollution he may have contracted. But the religion by which ablutions have been enjoined most punctiliously, and in the greatest number, is the Mohammedan. According to the precepts of the most rigid doctors of that faith, it may almost be said that scarcely the most ordinary or trifling action can be rightly performed without being either preceded or followed by an entire or partial lustration. The rules laid down upon the subject by these writers are minute and tedious, to a degree scarcely to be believed. The simple ceremony of the Christian baptism may be regarded as an adoption of this natural type by the Author of our faith. Although, however, that is the only instance in which dipping in or sprinkling with water has been enjoined under the dispensation of the New Testament, the early Christians appear to have been also in the habit of undergoing ablution with water, before partaking of the communion. The sprinkling with holy water, in use in the Catholic church, may be considered as a species of ablution; and that term is also applied both to the water in which the priest, who consecrates the host, washes his hands, and to a drop of wine and water which used anciently to be swallowed immediately after the holy wafer.

ABO, in N. lat. 60° 27′, E. long. 22° 15′, near the angle formed by the gulfs of Bothnia and Finland, is a town of the great principality of Finland, now part of the Russian empire. Abo is in that part of Finland which once belonged to Sweden, and it then was the chief city of all Finland. It stands on the Aurajoki river, and is surrounded by hills and mountains. In its neighbourhood is a mineral spring. The number of inhabitants is 12,550. The manufactures of Abo are tobacco, sugar, sail-cloth; and it trades in provisions and deals. There are also dockyards here. The fort of Abohus protects the entrance of the river, which does not admit vessels of large size to go up as far as the town. In the year 1827, seven hundred and eighty houses were destroyed by fire, together with the University buildings, the library, and all the valuable collections. Since this accident, the University has been removed to Helsingfors. (See Helsingfors.) Gustavus Adolphus, in the year 1628, founded this University, or rather instituted an Academy, which Christina, in 1640, elevated to the rank of a University. Alexander I. of Russia added to the endowments. (*Cannabich's Geography, German.*)

Many of the treaties between the great European powers are distinguished by the names of the places at which they were concluded. Thus, the *Peace of Abo* is often referred to in history, as the treaty by which the relations of Sweden and Russia were determined during the latter part of the last century.

A congress was opened at Abo in March, 1743, by the plenipotentiaries of Sweden and Russia, to confer on conditions of peace between those powers. The war, which it was the object of this conference to put an end to, had been commenced in 1741 by Sweden, who, still smarting from the concessions she had been compelled to make to Peter the Great by the treaty of Nystadt in 1721, took advantage of the war between Russia and Turkey to conclude an alliance with the latter power against Russia. The war was most disastrous to Sweden: the hopes she had conceived of assistance from Turkey were frustrated by the peace of Belgrade between Russia and the Porte, her best soldiers were defeated, and her armies in Finland destroyed in the first campaign.

The revolution in Russia, by which Ivan was dethroned, and the daughter of Peter set upon the throne, occasioned a suspension of arms, but in 1742 hostilities began again; Sweden was again defeated, and all Finland abandoned to the Russian arms.

The Swedish Diet met, and deliberated on offering the succession of the throne of Sweden to the Prince Royal of Denmark. Russia, fearing the union of the crowns, offered peace, and restitution of her conquests, on condition of the Diet's choosing Adolphus Frederic of Holstein Gottorp as the successor of the reigning king, Frederick, who was childless. The condition was accepted, and the election took place on the 4th of July, 1743.

By the stipulations of the treaty, which was signed on the 18th of August, N.S., Sweden renewed her cession of Ingria, Livonia, and Esthonia, which had been given up by the treaty of Nystadt, and was also compelled to yield the eastern portion of Finland, making the river Kymmene the boundary of the two nations. Russia restored the rest of the Grand Duchy, which she had gained in the war, including Abo, Biorneborg, and East Bothnia. It may be necessary to mention that the whole of Finland was ceded to Russia by a peace concluded between the two powers, on the 17th of September, 1809.

ABOMA, a large species of serpent, which inhabits the fens and morasses of South America. (See Boa.)

ABORIGINES, a term by which we denote the primitive inhabitants of a country. Thus, to take one of the most striking instances, when the continent and islands of America were discovered, they were found to be inhabited by various races of people, of whose immigration into those regions we have no historical accounts. All the tribes, then, of North America may, for the present, be considered as aborigines. We can, indeed, since the discovery of America, trace the movements of various tribes from one part of the continent to another; and, in this point of view, when we compare the tribes *one with another*, we cannot call a tribe which has changed its place of abode, aboriginal, with reference to the new country which it has occupied. The North American tribes that have moved from the east side of the Mississippi to the west of that river are not *aborigines* in their new territories. But the *whole mass* of American Indians must, for the present, be considered as *aboriginal* with respect to the rest of the world. The English, French, Germans, &c., who have settled in America, are, of course, not *aborigines* with reference to that continent, but settlers, or colonists.

If there is no reason to suppose that we can discover traces of any people who inhabited England prior to and different from those whom Julius Cæsar found here, then the Britons of Cæsar's time are the aborigines of this island.

The term aborigines first occurs in the Greek and Roman writers who treated of the earlier periods of Roman history, and, though interpreted by Dionysius of Halicarnassus to mean *ancestors*, it is more probable that it corresponds to the Greek word *autochthones*. This latter designation, indeed, expresses the most remote possible origin of a nation, for it signifies 'people coeval with the land which they inhabit.' The word *aborigines*, though perhaps not derived, as some suppose, from the Latin words *ab* and *origo*, still has the appearance of being a *general* term analogous to *autochthones*, and not the name of any people really known to history. The *aborigines* of the ancient legends, interwoven with the history of Rome, were the inhabitants of part of the country south of the Tiber, called by the Romans Latium, and now the Maremma of the Campagna di Roma; but we are, in truth, unable to say to what people this term may be properly applied. [See *Niebuhr's Roman History*.]

ABOU-HANNES (*Numenius Ibis*, Cuvier; *Tantalus Æthiopicus*, Latham), an African bird, which has occasioned much discussion among the learned as to its identity with the ancient Ibis. The attention of Bruce was attracted, during his stay in Upper Egypt, by some birds called by the natives Abou-Hannes, whose forms reminded him of the ibis, as represented on Egyptian monuments, and repeated observation confirmed him in the opinion of their identity with the ibis of the ancients. This identity was subsequently corroborated by the distinguished naturalists, Geoffroy and Savigny, who accompanied the French expedition into Egypt, and procured a number of specimens. M. Savigny published his observations in a small work (*L'Histoire Nat. et Mythol. de l'Ibis*), now very scarce, and Baron Cuvier also gave a memoir on the Egyptian ibis in the *Annales du Muséum* for 1804, in which he has clearly proved, from the comparison of a mummy ibis with a stuffed specimen, that the true ibis is not the *Tantalus ibis* of Linnæus, that being a much larger bird, but is really a species of curlew. This bird appears to be also a native of regions very remote from Egypt. After just getting round Cape Guardafui (sailing from the south), Salt saw, near the coast, a lagune abounding in wild fowl,—'on the borders of it stood birds of a species called by the Arabs, Abou-Hannes, which is the true Ibis of the Egyptians, as described by Herodotus; a fact strongly marked by the head and neck being bare, and of a deep black colour. It may be worthy of remark that Strabo mentions this bird as frequenting the coast to the east of the Straits of Babelmandeb.' (Salt, p. 97.) He adds, in a note, 'a tolerably good specimen of the bird is to be seen in Mr. Bullock's valuable Museum.'

[True White Ibis.]

Herodotus attributes the veneration of the Egyptians for the ibis, to supposed services rendered them by the bird in freeing their country from winged serpents. That the ibis, however, could not feed upon serpents appears nearly certain from anatomical inspection. The bill, for example, being long, slender, considerably curved, blunt on the edges, and expanded, and roundish at the point, could neither divide nor pierce serpents; and indicates rather an aptitude to dabble in marshy and moist grounds.

On the other hand, Baron Cuvier found, in the mummy of the ibis, remains of the skin and scales of serpents, and hence it has been inferred that the birds might have been serpent-eaters (*Ophiophagæ*). This inference, however, is at variance with the observations made in Egypt by M. Savigny on a great number of individuals, in the crops of which he uniformly found land and fresh-water shells (*Cyclostomata, Ampullariæ, Planorbæ, &c.*), and these shells were always entire when their inhabitants had not been previously digested.

It does not appear that the ibis breeds in Egypt; but, on the testimony of the inhabitants, it arrives as soon as the waters of the Nile begin to rise, augmenting in numbers as the waters increase, and diminishing as they subside, and disappearing when the inundation terminates. These birds, on their arrival, repair to the low lands, which are first covered with water; but when the waters become deeper and spread wider, the birds betake themselves to the higher lands. They afterwards approach the river, where they establish themselves by the sides of the canals and on the small dykes, with which the greater part of the cultivated grounds are surrounded.

The bird in question sometimes lives solitary, sometimes in small troops of from eight to ten. Its flight is lofty and powerful, and it utters at intervals hoarse cries. When it alights on a fresh piece of land, it remains for hours together occupied in tapping the mud with its bill, in search of worms, &c. It walks leisurely step by step, and has not been observed to run, like our curlew (*Numenius arquata*, Latham), to which it otherwise bears some resemblance.

The Egyptians call the bird *Abou-menzel*, which literally means 'Father sickle-bill;' the bill being curved like a sickle. The Æthiopian name, *Abou-Hannes*, means 'Father-John,' because, as M. Dumont supposes, the birds arrive about St. John's day.

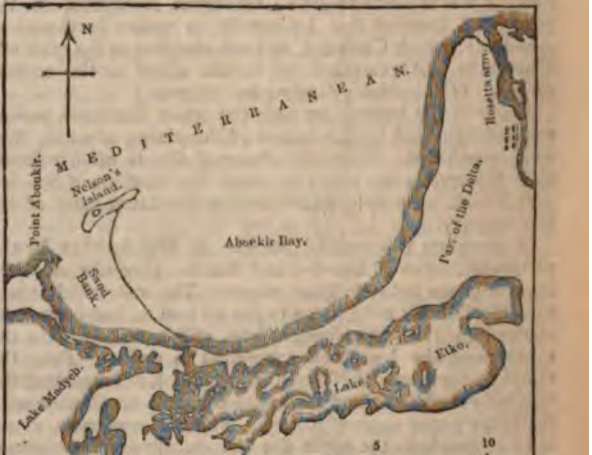
The following is the earliest account that we have of the ibis, from an eye-witness (Herodotus ii. 76):—'The ibis is all over very black: it has the legs of a crane, and a beak considerably curved: its size is about that of a *crex*. Such is the appearance of the black ibis, which fights against the serpents. But the other ibis, which is more of a domestic bird (for there are two kinds), has the head and all the neck bare of feathers: it is of a white colour, except the head, neck, and the extremities of the wings and tail, all which parts are very black. As to its legs and beak, it resembles the other kind of ibis.' The black ibis, according to Herodotus, devoured the winged serpents which yearly attempted to make their entry into Egypt from Arabia. It is needless to add that these winged serpents are a fable. Strabo, who himself was some time in Egypt, gives the following account:—'The ibis is the tamest bird of all: in form and size it is like the stork. But there are two varieties of colour, one of which is that of the stork, and the other is all black. Every street in Alexandria is filled with them, partly to the benefit of the citizens, and partly not. The bird is useful so far as it devours all kinds of vermin, with the garbage of the shambles, and the refuse of the eating-houses, &c.' Here Strabo makes no distinction between the two, except in colour, and he describes both species as living on all kinds of garbage. We believe, however, he has confounded the real ibis and the stork, as Hasselquist, a Danish traveller, confounded the real ibis and the heron. [See IBIS.]

ABOU-HARB, in Arabic, the name of the Leucoryx antelope.

ABOU-HOSSEIN, according to Rüppel, a late German traveller in Egypt and Nubia, the Arabic name of the *canis pallidus*, a small species of fox, found in Dar-Foor and Kordofan.

ABOUKIR. The castle of Aboukir (N. lat. 31° 19′, E. long. 30° 6′, and about thirteen miles N.E. of the town of Alexandria) is on the extreme north-eastern point of the low barrier of limestone rocks that form the breastwork of the coast of Alexandria. It marks, in fact, the extreme eastern limit, along the northern coast, of the rocks of the African continent, being immediately followed by the old Canopic mouth and the alluvium of the Delta. It is not unlikely that Aboukir castle is near the site of an ancient city, but whether this city was Canopus or not, we think it is impossible to decide, as the coast has undergone very great changes. Canopus, however, could not be more than a few miles distant from Aboukir, probably on the east side.

The small island which lies near Aboukir point contains traces of old buildings, and also evident marks of having once been larger than it is at present. This little spot is now commonly called Nelson's island, in commemoration of the victory which the English admiral obtained over the French fleet, under Brueys, in Aboukir bay, August 1, 1798 (see NELSON). Aboukir bay may be considered as bounded by Aboukir point on the south-west, and by the neck of land at the outlet of the Rosetta arm on the north-east.



ABOUSAMBUL, IPSAMBUL, or EBSAMBUL, a place remarkable for containing two of the most perfect specimens of Egyptian rock-cut temples. These excavations are in Nubia, on the west side of the Nile, N. lat. 22° 22′, about twenty-six geographical miles north of the cataracts of Wady Halfa. Near Abousambul the river flows from south west to north-east, through sandstone hills; on the west bank a valley opens and displays two faces or walls of rock, each of which has been fashioned into the front of a temple. The excavations are made in the solid mass of the mountain.

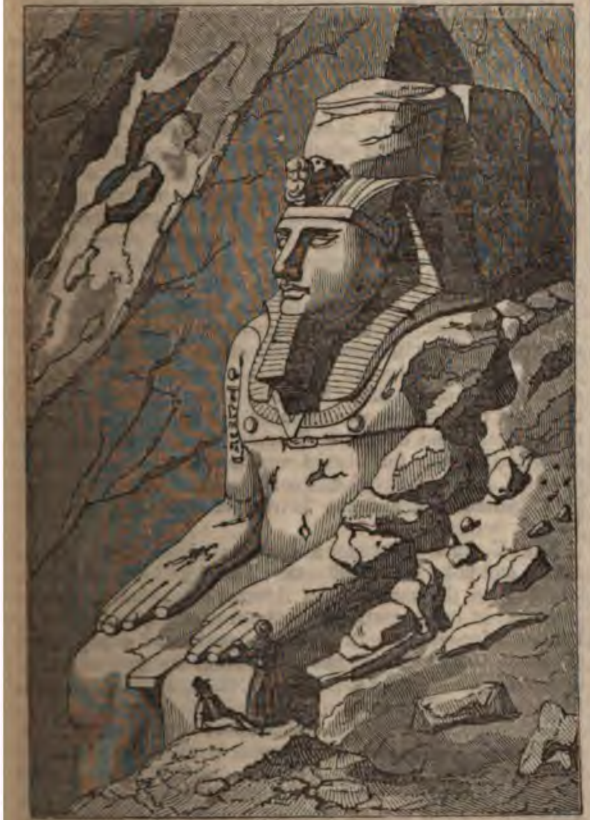
The smaller temple was first described by Burckhardt, who gave it the name of the Temple of Isis. It stands 20 feet above the present level of the river, is free from all incumbrance of dust or rubbish, and in a state almost as perfect as when it was just completed.

The façade of this excavation is the exact prototype of those masses of Egyptian architecture, called *propyla*: the face slopes outwards towards the base, thus preserving one chief characteristic of the pyramidal style of building. On each side of the door-way are three standing colossal figures, about 30 feet high, cut out of the rock, and deep sunk in niches; to the back part of which they are attached by a portion of the rock that has been allowed to remain. The figures have, as usual with Egyptian statues in a standing position, one foot advanced; they look towards the river. On each side of the larger figures stand smaller ones, from 4 to 6 feet high: we believe this is the case with all of them, though the print in Gau's splendid work on Nubia does not exhibit any smaller figures attached to the central one on each side, which is a female, and probably the representative of Isis. These smaller figures, however, appear in Gau's geometrical elevation. (pl. 54.) The two male figures, on the right side of the doorway, are probably Osiris: that nearest to the door, on the left hand, is the same; while the other male figure on this side has a different head-dress and expression of countenance, and is also an Osiris. He has horns on his head, supporting a disk. The whole façade is ornamented with hieroglyphics; among which we perceive several elliptical rings, which, it is now ascertained, contain the names and titles of kings. The rings on this temple present, with several variations, the name of Ramses, one of the several ancient monarchs of Egypt, who bore that name. If we consider the name to be that of Ramses the Great, the date of this excavation will be about B.C. 1500, provided we admit the inscription to be contemporary with the excavation—an hypothesis, however, that wants confirmation. It is not at all unlikely that the original excavation is of much higher antiquity than the sculptures of the outside, and the painted bas-reliefs of the interior.

The width of the front of this temple is about 90 feet: the depth measured from the centre of the door-way to the extremity of the adytum is 76 feet. From the door a passage leads to a room 35 feet by 36½, supported by six square pillars, three on each side, with Isis-headed capitals, similar to those of Denderah. From this apartment we pass into a narrow kind of vestibule, the direction of whose length is at right-angles to the axis of the excavation; and thence into the adytum or recess, which contains the remains of a sitting statue cut in the rock. There are two other small chambers besides those enumerated, one at each end of the vestibule just alluded to. The interior of this excavation is richly adorned with painted bas-reliefs, representing offerings of palm-branches and the lotus to Osiris, with other subjects usually found in the Egyptian sculptures. The figures are painted yellow with black hair; the head-dress of Isis is painted in black and white stripes; the ceiling is blue, which is a favourite colour for ceilings in the ancient buildings of Egypt.

But this excavation, magnificent as it is, sinks into insignificance when compared with another rock-cut temple, which is found a few hundred feet distant in the opposite side of the valley. The front of this temple was almost covered with sand, except the head and shoulders of one of the four colossi which decorate the façade, and the frieze and head of an enormous hawk. Belzoni, in the year 1817, with the assistance of Captains Irby and Mangles, and the aid of the miserable natives, succeeded in finding the entrance; but he had to remove 31 feet of sand before he came to the top of the door.

This excavation is about 100 feet above the level of the river, and faces south-east by east. The width of the front is 117 feet (127 according to Colonel Stratton), and 86 high: the height from the top of the door to the top of the cornice is 66 feet 6 inches; the height of the door is 20 feet. There are four enormous sitting colossi in front, which are the largest in all Egypt or Nubia.



[One of the Colossi of Abousambul.]

The following are some of the dimensions of this enormous figure: 25 feet 4 inches across the shoulders, the face 7 feet long, the nose 2 feet 8 inches, the beard 5 feet 6 inches; the whole height, as it sits, is about 50 feet, besides the cap, which is 14 feet high. Only two of these monsters are in sight; a third is buried in the sand, and the fourth has partly fallen down from the rock to which he was attached by the back, and is also covered. From some traces of colour on these figures, it seems probable that they were once painted, according to the Egyptian fashion. Over the door there is a figure in relief of Osiris, 20 feet high, in a niche, and with two colossal figures, one on each side looking towards it. The highest part of the façade is formed by a cornice, ornamented with hieroglyphics, and a moulding and frieze below it. Above the cornice is a row of twenty-two monkeys seated, about 8 feet high, and 6 across the shoulders.

The depth of the temple is about 170 feet. It contains in all fourteen apartments; but its several arrangements may be best understood, in the absence of a plan, by considering it as containing four principal chambers behind one another, with a number of attached apartments. To form anything like an adequate notion of this enormous excavation, it is necessary to consult the special descriptions to which we refer at the end of this article; but the following description of the Pronaos, or first great chamber, may serve to give some idea of the colossal dimensions of the whole. The first chamber is 57 feet long, and 52 wide, and is supported by two rows of square pillars, four in each row; each side of the pillars measures, according to some accounts, 5 feet, according to others 8 feet. Their height, according to Belzoni's account, is 30 feet. To each pillar is attached by his back a standing colossus, which, reaching the roof with its high cap, appears to support the incumbent mass. These figures are described as bold in their execution, and as producing an agreeable effect. Their arms are crossed on the breast; in one hand they bear the key of the Nile, and in the other the scourge. These statues are entirely covered with a kind of stucco, which is richly painted with various colours.

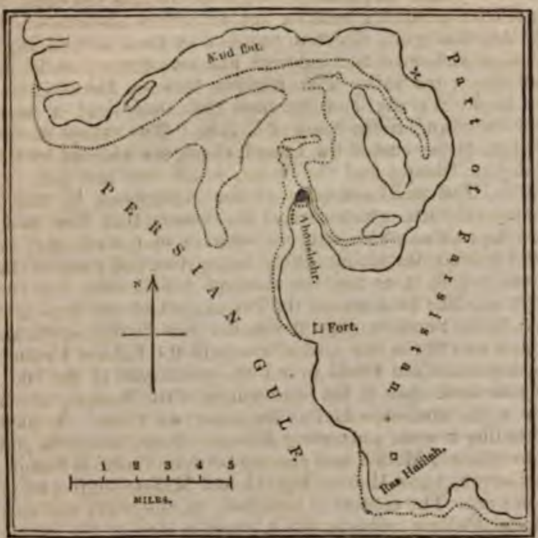
The painted walls, which represent a hero of colossal size gaining a victory over his enemies, triumphing, &c., are well worth a careful study, not only as works of art which possess merit in their way, but from the resemblance, in many respects, of the events here depicted to the battle-scenes represented on the walls of Thebes. They appear to be the records of great achievements, such as tradition assigns to Sesostris, who is now generally considered to be identical with Ramses the Great. The name and title of the latter monarch are found in many parts of the temple; and if he was not the original excavator, he may, perhaps, be considered, at least, as the completer of this great design.

In the adytum, or last chamber of the four above-mentioned, which is 23½ feet long, and 12 wide, there are four colossal painted figures seated at the extremity: in the centre of this room is a pedestal. Heeren conjectures that a sarcophagus once stood on this pedestal, and that we ought to consider this huge excavation not a temple, but a tomb.

The name Abousambul is variously written at the present day, and the origin of it is somewhat obscure. It seems most probable that it contains the syllable *Psam* (the name of a deity), which we observe in several Egyptian names, such as Psammis and Psammetichus. [See *Gau's Monuments of Nubia—Belzoni's Operations in Egypt and Nubia — Ritter's Africa—Col. Stratton, Edin. Phil. Journal—Egyptian Antiquitys of this Society.*]

ABOU-SCHOM, the Arabic name of a species of fox (*canis variegatus*) [Rüpp. *Zool. Atl.*, p. 31], discovered by Rüppel in Nubia and Upper Egypt. It does not burrow under ground, like the generality of foxes; but, like the jackall, resides among the rocks and deserts, and feeds upon lizards and small quadrupeds.

ABOUSHEHR, generally called **BUSHIRE**, is a town on the east side of the Persian gulf (N. lat. 28° 57′, E. long. 50° 52′), and now the principal sea-port in these waters. It stands on the northern extremity of a sandy peninsula, which is washed by the sea on the west side, and on the north and north-east bounded by an indentation of the sea, forming a deep bay. The country all around Bushire is parched and barren, showing nothing but grey clay, brown sand, and rock, without any kind of vegetation. Though the town looks pretty well from the sea, like most Persian towns the interior disappoints expectation, as the place does not contain more than half a dozen decent houses, which are built of sun-dried bricks. Since the decline of Bunder Abbas, or Gombroon, Bushire has become the great Persian emporium for the Indian trade, and its commerce is now considerable. Bullion and raw silk are the principal articles of export. Vessels of 300 tons cannot approach nearer the town than six miles. The population is probably as much as 10,000. [See *Kinneir's Memoir on Persia.*]



From Bushire to Shiraz in the interior, through which place a great part of the trade of Bushire passes, is a distance of about 152 miles following the road through Kazeroon, which, in many parts, is exceedingly steep and rugged.

ABOUSIR, a place in the Egyptian Delta on the site of the ancient Busiris (N. lat. 30° 55′), near the left bank of the Damietta branch of the Nile. Like most of the sites of ancient cities in the Delta, it has preserved its name almost unchanged, and enough still remains to show that a temple once existed here, as we know from Herodotus, though its traces are insignificant when compared with those of San, Tel Basta, and Heliopolis.

ABRAHAM (originally ABRAM), the great ancestor and founder of the Jewish nation, and the first depositary of the divine promises in favour of the chosen people. He was the eldest son of Terah, the eighth in descent from Shem, the eldest son of Noah, and was born, probably, at Ur, a town of Chaldæa, about 2000 years before the Christian era. His history occupies about a fourth part of the book of Genesis—namely, from the 11th to the 25th chapters inclusive. Having married Sarah (originally Sarai), his sister by the father's side, he accompanied his father and his nephew Lot to Haran, where Terah died; and then, at the command of God, still taking his wife and Lot along with him, he left Haran, and proceeded towards the south, till he reached the plain of Moreh, in Canaan. The epoch of the commencement of this journey, which happened when he was seventy-five years old, is called by chronologists the Call of Abraham. Soon after, a famine forced the patriarch to make a journey into Egypt; from which country, when he had returned to the place of his abode in Canaan, he found that the increase of his own flocks, and those of his nephew, made it necessary that they should choose separate settlements; and, accordingly, by mutual consent, Lot withdrew towards the east, and established himself among the cities in the plain of Jordan, while Abraham removed to the plain of Mamre in Hebron. He had reached his ninety-ninth year, and his wife, who had been hitherto barren, her eighty-ninth, when God appeared to him, and declared that there should yet spring from them a great nation: a promise which was confirmed, to the almost incredulous mother, by the birth of Isaac the following year. The severe trial of Abraham's faith, in the command given him to sacrifice this beloved son, so beautifully related in the 22nd chapter of Genesis, is familiar to every reader. Some time before this, we may remark, he had given another striking proof of his submission to the divine will, and his implicit reliance on the promises of God, in his dismissal of his son Ishmael, whom he had by Hagar, the Egyptian bondwoman, on the assurance of his heavenly father, that of him, too, would he make a nation, because he was the patriarch's seed. Although Sarah's determination, that the bondwoman and her offspring should no longer remain in the house, 'was,' we are told, 'very grievous in Abraham's sight, because of his son,' he had no sooner received the above intimation from on High, than he 'rose up early in the morning, and took bread, and a bottle of water, and gave it unto Hagar, putting it on her shoulder, and the child, and sent her away.' The Arabs claim to have sprung from Ishmael, as did the Hebrews from Isaac. After the death of Sarah, at the age of 127, Abraham married Keturah, and by her had other six sons. The venerable patriarch died at the age of 175, and was buried, by Isaac and Ishmael, in the same tomb which contained his first wife in Mamre. Abraham is mentioned by the epitomist Justin, who, on the authority of his original *Trogus Pompeius*, inaccurately says of the Jews, that they derive their origin from Damascus, a famous city of Syria, and that their kings were Abraham and Israel.

ABRAHAM MEN. 'To sham Abraham' is a well known cant expression, which has reference to the practices of a large class of vagabonds and cheats who were once common in this country. An Abraham Man was an impostor who personated a 'Tom of Bedlam,'—an unhappy being who was turned out of a lunatic hospital to subsist upon casual alms, incurable but harmless, without a home, but still maintained by public sympathy. This class of persons was so numerous at a period when there was very insufficient provision for the cure or mitigation of the greatest of human calamities, that the charity of the kind-hearted inhabitants of the small towns and villages was largely taxed for their support; and the appeal thus made to the feelings by a poor creature, fantastically clothed in tawdry rags, and singing snatches of old songs, was so irresistible, that it became a profitable trade to imitate such an unfortunate being. In Decker's *English Villanies*, written more than two centuries ago, there are many curious particulars of the habits of this class of impostors; these details, in great part, agree with the rich description which Shakspeare has given in his *Lear* (Act ii. scene 3.) of a pretended 'Poor Tom,' who has put on

> 'The basest and most poorest shape,
> That ever penury, in contempt of man,
> Brought near to beast.'

[See D'Israeli's *Curiosities of Literature*, vol. iii.]

ABRANTES, a fortified town of Portugal, in the province of Estremadura, on a hill near the Tagus (N. lat. 39° 27′, W. long. 8° 11′), 74 miles north-east of Lisbon. It has about 5000 inhabitants. The eminence on which the town stands is covered with olive-yards and gardens; and, indeed, the whole country along the Tagus, as far as Lisbon, is exceedingly fertile. Abrantes has several churches and convents; but its value, as a military position, constitutes its chief importance. Abrantes gave the title of Duke to Marshal Junot, one of Buonaparte's generals.

ABRUZZO, a name given to three of the fifteen divisions of the kingdom of Naples in Italy: the *Abruzzo Ultra*, or Further Abruzzo 1 and 2, and the *Abruzzo Citra*, or the Nearer Abruzzo. They are thus distinguished from their relative position with regard to the capital, Naples.

The Further Abruzzo 1 contains about 1143 English square miles, and (1825) 174,370 inhabitants, who are one of the most industrious manufacturing people in the kingdom of Naples. The capital is Teramo, on the Tordino, with 6000 inhabitants: this district contains also the considerable towns of Atri and Cività di Penna, each of which has about 9000 inhabitants, and the fortress of Civitella, near the Roman frontier.

The Further Abruzzo 2 contains about 2220 square miles, and 259,114 inhabitants. The chief town is Aquila, on a hill on the banks of the Aterno, otherwise called the Pescara: it has a castle, manufactures of paper, stockings, leather, a lyceum, a high court of appeals, and a population of about 10,000 inhabitants. Sulmona, the ancient Sulmo and the birth-place of Ovid, and Celano, about four miles from the lake of the same name, belong to this province.

The Nearer Abruzzo contains about 1700 square miles, and 260,250 inhabitants, who possess considerable manufacturing industry. Chieti or Teti, the ancient Teate, near the Pescara, is said to have above 12,000 inhabitants. The Theatine order of monks, founded in 1524, take their name from this place. The fortress of Pescara and the towns of Ortona on the sea, and Lanciano on the Foltrino, belong to this division of the Abruzzi.—(*Cannabich's Geog.*)

The origin of the name Abruzzo is uncertain. Some would derive it from the Prætutii, a nation that formerly dwelt near the eastern coast. The form in which the word appears in the oldest Italian writers is Bruzio, the *a* in the beginning of the modern name being no efficient part of it.

The provinces of the Abruzzi present to the Adriatic a coast about eighty miles in length, with hardly an indention or projection that deserves notice, except the point called Penna, and not a single harbour for moderate-sized vessels. The northern boundary, between the States of the Church and the Abruzzi, commences at the mouth of the Tronto. Running irregularly westward, and then south, it strikes the river Velino near Rieti; from this point its general direction, which is south-east, follows a high mountain range, which, however, must not be considered as the dividing line of the waters that fall into the Adriatic and the opposite or Tuscan sea. The southern boundary of the Abruzzi commences near the mouth of the Trigno, half way between the towns of Vasto and Termoli on the Adriatic coast, and, after a short deviation from the course of this stream, follows it upwards for some distance. It then runs, irregularly, westward and northward, nearly parallel to the course of the Sangro, and keeping along the summit of the high central ridge that divides the waters of this river from those of the Volturno, it then descends into the valley of the Liris, which river it crosses above Sora, where we may consider it as uniting with the line just described running south-east from Rieti. A traveller going from Arpino (Arpinum), the birth-place of Cicero, to the Lake Celano, must cross the Liris, and the first village in the Abruzzi that he will come to, is a little place called Balzerano. Around this place the mountains are lofty and well wooded, containing oaks of a larger size than usual in Italy; some of the mountains on the 6th of May, according to Colt Hoare, were capped with snow. From Balzerano the road runs along the mountain sides, through rocks and oak forests, and over the high eminence of Morrea, to the still greater elevation of Antino, a place remarkable for remains of its original walls, built without cement, and for many Roman inscriptions, which prove the Roman name of the town to have been Antinum. From Antino to Capistrello, the valley of the river becomes so narrow, as to admit only a passage for the water, and a road along the brink. The traveller, ascending along this wild and picturesque track, perceives that he is approaching the sources of the Liris, and the basin of the lake Celano. This lake, the Fucinus of the Romans, is only a short distance from Capistrello: its greatest length is about fifteen miles, with a breadth averaging about five or six. It is subject to rises and falls, which are difficult to explain, and, indeed, without more information on the subject than can be found in books of ordinary access, there is no use in hazarding any opinion. It is said to contain many fish. The Emperor Claudius undertook a great work for the purpose of draining the lake, or, at least, preventing it from doing damage by overflowing. Suetonius says of it, 'he undertook the Fucine lake, no less from the hope of speedily completing the task, than from the love of glory. Some private individuals had already offered to construct the necessary drain, on condition of having the lands that were recovered. Claudius made a canal three miles long, partly by perforating and partly by cutting down a mountain. It was finished in eleven years, thirty thousand men having been constantly employed thereon. 'The emissary,' says Sir R. C. Hoare, 'commences in a plain near the lake, traverses a mountain of solid rock, and pursues its course through the Campi Palentini to Capistrello, where it discharges itself into the Liris. The present emissary is far advanced into the lake, and considerably below the ordinary surface of the water.' At present the emissary is blocked up, except a portion of the exit near Capistrello, which has been so far cleared as to show the nature of the work. Fazio, a living Neapolitan engineer, has written a memoir on the subject, showing that the emissary might be easily repaired; and a company of land proprietors was formed, some years since, to recover, by drainage, the lands overflowed by the lake. The works for cleansing the emissary were, according to late accounts, in a state of progress, under the direction of an architect. A little to the north of the lake is the deserted village of Albi, on an eminence, probably the Alba Fucinensis of the Romans. From Avezzano, which is near the lake, the traveller may proceed northwards, through the valley of Cesolino to Tagliacozzo, built on the right side of a deep ravine. 'On ascending the hill,' says Sir R. C. Hoare, 'May 17, a dreary extent of rocky mountain expanded itself to my view, and the trees had not yet laid aside their wintry garb, but were just pushing forth their leaves.'

The mountains of the Abruzzi, though forming an essential part of the Apennine chain, and therefore running, generally, from north-west to south-east, are extremely irregular. They send out smaller branches towards the coast of the Adriatic, forming beds for the numerous streams which flow into that gulf. In the centre they form several high ridges, sometimes diverging from, and sometimes parallel to, each other; the valley of Aquila lies between Monte Corno and Monte Velino, and between the latter and a more southern ridge lies the basin of Celano. The valleys of the Abruzzi, to the west of the Lake Celano, are watered by the Liris, the Turano, and the Salto, which two last join the Velino. The real back-bone of the Apennines, by which we mean the line which divides the waters that flow eastward from those which run westward or southward, may be traced between the sources of the latter river and those of the Tronto, which flows into the Adriatic. Following it to the south, we find the sources of the Pescara, which also runs into the Adriatic; and we trace the main chain farther south, on the east side of the basin, which contains the Lake of Celano. The direction then winds round the south part of the lake, and afterwards runs to the head-waters of the Sangro, which flows in the same direction as the other two rivers. It then strikes direct east, separating Abruzzo from Campania and the province of Molise, and passing between Castel di Sangro and Isernia, joins Mounts Biferno and Matese south-east of the latter. The central Apennines, to the north and east of Lake Celano, contain the highest points in the whole range. Monte Velino is seen from the eminence of Albi to the north, raising its lofty head 8397 feet. Farther north, Monte Corno, the highest point of the Apennines, sometimes called the great rock of Italy (*il gran sasso d' Italia*), rises to the height of 9521 feet, and its summit is covered with snow, sometimes perhaps through the whole year. Vegetation, however, ceases only 600 feet below its highest point. Another lofty mountain, called Monte Majella, projects out of the main ridge between the valley of the Pescara and that of the Sangro, to the north-east of Sulmona, its highest summit being 8500 feet. This is an extinct volcano. The mountains of Abruzzo are among the finest in the whole Apennine range. They are less naked than those further north, and they present groups of a bolder and more romantic appearance. Spreading over a vast extent of country, 50 or 60 miles in breadth, they enclose delightful valleys, towns, and a numerous population within their various ridges: the whole province of Aquila is, in fact, encircled by them. These mountains are calcareous, like the great mass of the Apennines. M. Orsini, a naturalist from Ascoli, observed on the sides of Monte Corno, masses of gneiss laid bare by the waters which had carried off the crust of alpine lime, of which the external cliffs are formed. A party of botanists from Naples visited these mountains in the summer of 1829, they ascended Mounts Velino, Corno, Majella, and other high pinnacles. M. Tenora, one of the party, published an account of their observations. They found Mount Velino rich in rare plants, and the view from its summit magnificent. They suffered much from thirst, as they met with no springs on this mountain.

The brief description of Antinori, an Italian writer, is, on the whole, correct:—'There are, in many places, rough and inaccessible mountains always covered with snow, wild forests, pleasant woods, agreeable pastures, clear fountains, deep lakes, and many rivers of every size, which run from the one, or the other side, to seek the one or the other sea of Italy.'

The natives of the highlands of Abruzzo are chiefly employed in the rearing and tending of sheep, numerous flocks of which, after feeding on the mountain pastures during summer, migrate to the plains of Puglia at the approach of winter. The shepherds are generally accompanied by their wives and children in these yearly migrations to and from the mountains, and by their large white dogs, which are very fierce to strangers. The sheep's milk is used to make cheese, the wool is an important article of trade, and the skins are exported in great quantities to the Levant. The shepherds also are clothed in them, and wear sandals of untanned leather, fastened with small cords, round the leg: they are a quiet, frugal, and honest race. The breed of merino sheep has lately been introduced into the Abruzzi near Sulmona and Valloscura, wool being now in great demand for the fast-increasing manufactures of the kingdom. The labourers and farmers in the Abruzzi are mostly poor, few of the latter being proprietors; and although the feudal duties have been long since abolished, yet the land-tax is very oppressive, amounting in many instances to 30 per cent. on the estimated income of the land. Improvements in agriculture, and especially in the method of manuring the land, are little known. Numerous herds of swine are fed in the extensive oak forests that cover the mountain sides; and the hams and sausages of Abruzzo are in great request. Lamb and mutton are also of excellent quality.

The woods of the Abruzzi have been sadly laid waste during the last thirty years: fine timber trees, oaks and beeches, have been wantonly cut down; and the mountains having thus been laid bare, the rain and melted snow, meeting with no obstacle, have washed off the soil, and carried devastation into the fields below. A want of fuel has been felt in many places, which is a serious evil in the high regions that are exposed to eight months' winter; but to remedy this inconvenience, the government has now relieved the new plantations from taxation. The mountain fastnesses are inhabited by bears, wolves, and wild boars. These provinces are but little frequented by travellers. Sir R. C. Hoare, who visited the Lake Celano, says of this country:—'The province of Abruzzo, unfrequented by the generality of travellers, and unknown even to the inhabitants of the neighbouring districts, like Sicily, has been represented as a country uncivilized with regard to society, infested by robbers, inaccessible from mountains, and fitter for the residence of wild beasts than of rational beings. But I must here repeat, with gratitude, that, in these romantic, unfrequented tracts, we met with that genuine and cordial hospitality which is too seldom to be found in more favoured and more populous countries.'

The natives of Abruzzo are generally tall, robust, and healthy; their countenances are mild, and their manner quiet and civil; they are intelligent, industrious, and brave, and furnish the best soldiers in the Neapolitan service. They are hospitable; even the poor peasant will cheerfully receive the stranger into his cabin, and offer him a share of his scanty pittance. Their cabins, however, are often miserable, smoky, and filthy; the pig and the donkey share them with the family. The chief article of food consists of Indian corn flour boiled in water or skimmed milk; wheaten bread is a luxury; wine, however, is drank generally, being imported from the neighbouring districts. The women work in the fields as hard as the men. Thousands of peasants leave their mountains in the autumn, to go and work in the vast farms of the Roman lowlands, and return in the beginning of summer; whilst others proceed at that period to reap the harvest in the unwholesome plains, and to brave the malaria fever, which makes great havoc among them. Many of the Abruzzi shepherds may be seen in December perambulating the streets of Naples and of Rome, with their bagpipes, with which they go playing from house to house, in honour of the approaching Christmas festivities. Others come to live altogether at Naples, where they employ themselves as porters, grooms, and in other hard service; and they bear a general reputation for honesty above the natives of the other provinces of the kingdom. Indeed, a traveller may ramble over the wild mountains and glens of Abruzzo in greater safety than through the fertile plains of Campania. The natives of Abruzzo speak better Italian than those of the other provinces of the kingdom; in fact, they cannot be said to speak a dialect; their language, especially at Aquila, and round the Lake of Celano, resembles that of their neighbours of the Roman States. The young men, who can afford it, repair to Rome and Naples to follow their studies, and generally distinguish themselves by their assiduity and regularity.

The lower parts of the Abruzzi have a productive soil, and export a considerable amount of grain, oil, and almonds: they also produce some cotton. In some parts of the Abruzzi we find the system of terrace husbandry, which has converted the arid hills of Tuscany into productive gardens. Of the three provinces that of Aquila is the most mountainous and the poorest; the city of Aquila, however, is considered as one of the principal provincial towns in the kingdom, and contains many wealthy families. Its territory produces excellent saffron. The province of Teramo is fruitful in rice and corn. That of Chieti is the most fertile of all, and its wines are much esteemed. The olive grows in both the latter provinces. The city of Chieti, the finest in all Abruzzo, is well built, in a delightful situation, ten miles from the sea, has manufactures of silks and woollens, a lyceum, a theatre, several literary societies, and is a place of considerable wealth and luxury. Abruzzo is, upon the whole, a very important as well as very interesting division of the Neapolitan States, of which it constitutes the chief defence on the land side. During the numerous invasions and civil wars of that kingdom, it has been often the scene of protracted contests. It was at Tagliacozzo that the unfortunate Corradino was defeated by Charles of Anjou. It was likewise in the Abruzzi that Alfonso of Aragon recruited his party and maintained himself for years, until at last he was enabled to drive away René, the last of the Anjou kings, from the throne of Naples. The possession of the Abruzzi has always tended materially to decide the fate of Naples. In 1799 the mountaineers strenuously opposed the French troops, and assisted in the recovery of the kingdom.

Albanian and Greek colonies are found scattered about the Abruzzi, as well as in the other eastern provinces of the kingdom of Naples. They occupy whole villages with the districts around them, and form so many distinct populations in the midst of the indigenous inhabitants, preserving the manners, the language, and partially the dress, of their ancestors. These colonies date from different periods: the Albanian or Epirote emigration took place in the fifteenth century, in the time of Scanderbeg and his son John Castriot. The town of Ururi, on the borders of the nearer Abruzzo and Puglia, is an Albanian colony. The Greek emigrants from the Morea came away when that peninsula was lost to the Venetians in the last century; the town of Villa Badessa, in the farther Abruzzo, was peopled by them. These people associate but little with the surrounding population, who look upon them as semi-barbarous strangers; they are, however, acknowledged to be industrious, brave, tenacious of their lands and privileges, honest, jealous of the honour of their women, and strongly united among themselves. The whole number of their villages or colonies throughout the kingdom is about fifty, and their whole population is estimated at 52,000.

Three roads lead into the Abruzzi from the Roman States, one, which is a post-road, on the Adriatic side, proceeds from Ascoli to Teramo, and thence to Penna and Sulmona, where it joins the high-road to Naples. The second is a mountain-road, leading from Rieti to Civita Ducale, and by the pass of Antrodoco to Aquila. The third, also a mountain pass, leads direct from Rome by Tivoli and Vicovaro to Tagliacozzo, and the banks of the Lake of Celano. The only carriage-road from Naples to Abruzzo leads by Venafro to Isernia, in the province of Molise, the ancient Samnium; thence over the central Apennines to Castel di Sangro, which is the first town in Abruzzo, and further over a high wild mountainous region to Sulmona and Popoli on the Pescara, where the road divides, one branch to the left leading to Aquila, and the other to Chieti.—[*Zannoni's Map of the Kingdom of Naples—Balbi's Geography—Tenore, viaggio in Abruzzo,* Naples, 1830—*Classical Tour by Sir R. C. Hoare,* 4to. 1819.]

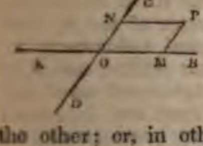
ABSCESS, (from a Latin word, *Abscedo*, implying separation,) is so called, because parts which were in contact have become separated. An abscess consists of a collection of the matter termed pus, in some tissue, or organ of the body. Purulent matter, or pus, is formed out of the blood by the process termed secretion. Of the intimate nature of this process, as of that of all the other secretions, we are ignorant. What is certain is, that the formation of pus is never a healthy process, and never an original disease. It is always the result of another disease,—namely, inflammation; or, if there be any exceptions, they are so few that they need not be taken into account here. The process consequent on an inflammation, by which pus is secreted, is termed the process of Suppuration, of which we shall speak further under the article INFLAMMATION.

The purulent matter constituting an abscess, properly so called, is always confined within a definite space: the means by which it is confined vary. Sometimes the purulent matter is effused into the substance of an organ; in this case some portion of that part of the blood which is called *fibrin*, or coagulable lymph, is effused with it; this fibrin coagulates into a firm solid, encloses the pus, and so prevents its diffusion. Sometimes the effused fibrin, or coagulable lymph, becomes organized; in this case it forms a new membrane, which is called an *adventitious* membrane, and the pus is completely enclosed in this new membrane as in a bag, or shut sac or *cyst*: an abscess of this kind is called an *encysted* abscess, and the internal surface of this cyst is always endowed with the properties both of absorption and of secretion; for large collections of matter, enclosed in bags of this kind, occasionally disappear without any external opening; and on the other hand, when such a bag has been completely emptied of its contents, it is sometimes rapidly refilled with pus. When an opening is formed in an abscess, and purulent matter continues to be discharged from it, it loses the name of abscess, and takes that of ulcer.

Purulent matter is poured out from the blood in other modes, and forms other collections of pus; but these latter collections are never called abscesses. Sometimes, for example, the pus, as it is secreted from the blood, is diffused through the substance of the inflamed organ. This is the case especially with the lung during the progress of inflammation. This diffusion of purulent matter through the substance of an inflamed organ is termed INFILTRATION; and, instead of containing an abscess, the organ is said to have pus infiltrated through it.

Again, collections of purulent matter are often formed in natural cavities. The cavity of the thorax, for example, is lined with a serous membrane called the PLEURA, and the cavity of the abdomen with a serous membrane called the PERITONEUM. In consequence of the inflammation of these membranes, pus is often poured out on their surface, and accordingly large quantities of it are found accumulated in those cavities: but in this case it is merely said that pus is contained in the cavity of the thorax or in that of the abdomen; we never say that those cavities form abscesses.

There are few tissues of the body, and still fewer organs, in which abscesses may not form. They are found in the brain, the lungs, the heart, the liver, the spleen, the uterus, the ovaria, the cellular membrane, and the joints. In some of these organs the disease is highly dangerous, in others certainly fatal, in others comparatively unimportant. In whatever organ an abscess may have its seat, the affection will give rise to a peculiar and definite train of symptoms dependant on the peculiar structure and function of the organ affected; but the symptoms which attend the formation of abscesses, and the phenomena which accompany and denote the successive stages of their progress, the different modes in which they terminate, their diagnostic or distinctive signs, and their treatment, all these topics belong properly to the subject of suppuration, and will be treated of under the article INFLAMMATION.



ABSCISSA, or LINEA ABSCISSA, a line cut off, is a mathematical term, used as follows: If any two right lines AB, CD, be given, meeting in O, the position of any point, P, in the plane of those lines, is known when we know (I.) within which of the four angles, BOC, COA, AOD, DOB, it lies, and (II.) what is its distance from each line, measured on a line parallel to the other; or, in other words, what are the sides of the parallelogram OMPN. Either of these sides being called the *abscissa*, the other is called the *ordinate*; both are called *co-ordinates*; the straight lines, AB and CD, are called the *axes*, and O is called the *origin*. It is customary to denote the lengths of the abscissa and ordinates by the letters x and y respectively. Thus, OM being the abscissa of the point P, PM is its ordinate. All points in the line PM have the same abscissa; all those in PN the same ordinate.—See EQUATION, CURVE, POSITIVE, NEGATIVE.

ABSENTEE. This is a term applied, generally by way of reproach, to that class of capitalists who, deriving their income from one country, reside in another country, in which they expend their property. The name has been adopted in political economy; and it is with reference to the principles of that science that we here propose to state some of the more material points in a controverted question of great interest,—namely, whether the consumption of absentees is really an evil to the particular country from which they derive their revenues. It is of the more importance that a right judgment should be formed upon this matter, as there is a decided tendency in the progress of social intercourse to loosen the ties which formerly bound an individual or a family to one particular spot. From the improvement of roads, and the rapidity and certainty of steam navigation, Dublin is now as near, in point of time, to London, as Bath was half a century ago; and the distance between England and every part of the continent is in the same way daily diminishing. With the conviction, therefore, that the inducements to absenteeism, whether from Ireland to England, or from England to the Continent, are constantly increasing, it would be satisfactory to find that a theory which asserts that absenteeism is not wholly an evil, has some foundation in reason and experience.

The expenditure of a landed proprietor resident upon his estate, calls, or appears to call, into action, the industry of a number of labourers, domestics, artisans, and tradesmen. If the landlord remove to another part of the same country, the labourers remain; the domestic servants probably remove with him; but the artisans and tradesmen whom he formerly employed lose that encouragement which they once derived in the exchange of their skill or commodities for a portion of the landlord's capital. It never occurs to those who observe, and perhaps deplore these changes, that the landlord ought to be prevented spending his money in what part of his own country he pleases. They conclude, reasonably enough, that there is only a fresh distribution of the landlord's revenues; and that new tradesmen and mechanics have obtained the custom which the old ones, through uncontrollable circumstances, have lost. But let the same landlord go to reside in a foreign country—let the Englishman go to France or Italy, or the Irishman to England,—and it is immediately asserted that the amount of revenue which he spends in the foreign country is so much clear loss to the country from which he derives his property, and so much encouragement withdrawn from its industry; and that he ought, therefore, to be compelled to stay at home, instead of draining his native land for the support of foreign rivals. Some of the more eminent of our political economists maintain that this is a popular delusion, and that, in point of fact, the revenue spent by the landlord in a foreign country has precisely the same effect upon the industry of his own country, as if his consumption took place at home, for that, in either case, it is unproductive consumption. We will endeavour to state their arguments as briefly as we can.

Let us suppose a landowner deriving an income of 1000*l.* a-year from an estate in one of our agricultural counties. We will leave out of the consideration whether he resides or not upon that estate;—whether he lives in the hall of his fathers, employing the moral influences of property for the amelioration of the lot of his poorer neighbours, or lets that hall, as well as his paternal acres, to one or more farmers. The landowner resides himself in London, or Brighton, or Cheltenham, or any other place congenial to his taste. With his rents he probably purchases many articles of foreign production, which have been exchanged for the productions of our own country. No one questions his right to purchase these foreign productions; for there are few people now who do not understand that if we did not take from foreigners the goods which they can produce cheaper and better than we can, we should not send to foreigners the goods which we can produce cheaper and better than they can. If we did not take wines from the continental nations, for instance, we should not send to the continental nations our cottons and hardware; and the same principle applies to all the countries of the earth with which we have commercial intercourse. The landlord, therefore, by consuming the foreign wines encourages our own manufactures of cotton and hardware, as much as if, drinking no foreign wine at all, he applied the money so saved to the direct purchases of cotton and hardware at home. But he even bestows a greater encouragement upon native industry, by consuming wine which has been exchanged for cotton and hardware, than if he abstained from drinking the wine: for he doubtless himself uses as much cotton and hardware as he wants, as well as the wine; and by using the wine he enables other people in Europe to use the cotton and hardware, who would otherwise have gone without it. For all that he consumes of foreign produce, some English produce has been sent in exchange. Whatever may be the difference between the government accounts of exports and imports (than which nothing can be more fallacious), there is a real balance between the goods we send away and the goods we receive; and thus the intrinsic value of all foreign trade is this,—that it opens a larger store of commodities to the consumers, whilst it developes a wider field of industry for the producers. (See EXPORTS.) There used to be a notion, which, for many years, governed the decisions of our legislators, that unless we sent away to foreigners a great many more goods than we received from them, or, in other words, unless our exports were much greater than our imports, the balance of trade was against us. (See BALANCE OF TRADE.) This notion was founded upon the belief, that if we sent away a greater amount of goods than those we received in exchange, we should be paid the difference in bullion; and that the nation would be rich, not in the proportion in which it was industrious at home, and in which its industry obtained foreign products in exchange for native products, but as it got a surplus of gold, year by year, through its foreign trade. Now, in point of fact, no such surplus ever did accrue, or ever could have accrued; for the commercial transactions between one country and another are nothing but a series of exchanges or barter, and gold is only the standard by which those exchanges are regulated. (See Bullion.) We shall see how these considerations bear upon the relations of the English landlord to his native country when he becomes an absentee.

When the landlord, whose case we have supposed, resided upon his estate, he probably received his rental direct from his tenants. That rental was, in truth, the landlord's share of as many quarters of corn, as many head of oxen and sheep, as many fleeces of wool, as many fowls, as many pounds of butter, and so forth, as the estate produced. Three or four centuries ago the landlord's share was paid in kind: for the convenience of all parties, it is now paid in money, or, in other words, the tenant sells the landlord's share, as well as his own share, and pays over the amount of his share to the landlord, in a money-rent, instead of in produce. When the landlord removes to a distant part of the country, this arrangement of modern times becomes doubly convenient. The rental is then collected by a steward, and is probably paid into the hands of a country banker, who draws a bill of exchange in favour of the landlord. By this process, the produce of the land may be most advantageously sold; and the landlord receives the amount of his share at his own door, without even the risk of sending money from one part of the kingdom to another. If it were not so, the servants of a great landed proprietor residing in London might announce to their master,—

> 'A hundred oxen at your levee roar.'

If the landlord becomes an absentee, the process of remitting his rental assumes a more complicated shape. We will suppose that his inclination leads him to settle in the Netherlands. His means of living there depend upon the punctual transmission of the value of his share of the corn, cattle, and other produce growing upon his estate in England. To make the remittance in bullion would not only be expensive, but unsafe: and, indeed, remittances in bullion can never be made to any considerable extent (such as the demands of absentees would require) from one country to another; for these large remittances would produce a scarcity of money at home, and then the bullion being raised in value, its remittance would necessarily cease. (See Course of Exchange.) Although the expenses of our armies in the Peninsula, in 1812-13, amounted to nearly 32,000,000*l.*, the remittances in coin were little more than 3,000,000*l.* Nearly all foreign remittances are carried on by bills of exchange. The operation of a bill of exchange, in connexion with our absentee landlord, would be this. He is a consumer now, in great part, of foreign produce; he probably requires many articles of English produce, through the effect of habit; but whether or no, there must be an export of English goods to the amount of the foreign goods he consumes, otherwise his remittances could not be made to him. He draws a bill upon England, which he pays, through a banker, to a merchant at Antwerp. This bill represents his share of the corn and cattle upon his farm; but the merchant at Antwerp, who does not want corn and cattle, transmits it to a merchant at London, in payment for cotton goods and hardware, which he does want. Or there may be another process. The agent, in England, of the absentee landlord, may procure a bill upon the merchant at Antwerp, which he transmits to the English landlord; and the merchant at Antwerp, recognising in that bill the representation of a debt which he has incurred to England, hands over the proceeds to the bearer of the bill. In either case the bill represents the value of English commodities exported to foreigners. We thus perceive how the consumption of an English resident in a foreign state, out of a capital derived from England, produces, in principle, the same indirect effects upon English industry, as his partial or entire consumption of foreign goods in England. His consumption of foreign goods abroad is equivalent to an importation of foreign goods into England; and that consumption produces a correspondent exportation of English goods to the foreigner. Let it not be said that England sends out a thousand pounds' worth of her exports in consequence of the absentee's residence abroad, and gets nothing in return. She would have had to pay a thousand pounds to the landlord wherever he resided; and the only question is, whether she pays the amount less advantageously for the national welfare to the absentee, than to the resident at home. The political economists, whose opinions we have endeavoured to exhibit, maintain that she does not. It is probable that a good deal of the difficulty which this question presents, has arisen from the circumstance, that the subtraction of a particular amount of expenditure from a particular district, is felt in the immediate locality as an evil; while the benefit which still remains to the whole country is not perceived, because it is universally diffused.

But it would be a widely-different question if the absentee landlord, who had been accustomed to expend a certain portion of his income in the improvement of his estate in England, were to suspend those improvements, and invest his surplus capital in undertakings in a foreign country. This the political economists, who have been most consistent in their opinions as to the effects of absentee consumption, never maintained: if they had, they would have confounded the great distinction between accumulation and consumption, upon which the very foundations of their science rest.—(See Accumulation.)—In many cases the smaller consumption of an absentee, in a country where the necessaries of life are cheap, enables him to accumulate with greater ease than he could at home; and this accumulation is, in nearly every case, invested at home. It is the same thing whether the absentee improves his own estate by the accumulation, or lends the amount of the capital so saved to other encouragers of industry at home. Nor could the political economists ever have intended, we apprehend, in maintaining, as a mere question of wealth, that it was a matter of indifference where an income was spent, to put out of view the moral advantages which arise out of a just and rational course of individual expenditure. The absurd notion, which even the philosopher Montesquieu fell into in the last century, that if the rich did not spend liberally the poor would die of hunger, is fast passing away; because it is evident that whenever a portion of this particular consumption is suspended, there is an accumulation of capital, which is sure to set profitable industry to work in some way or other. But at the same time, without attaching undue importance to the influence of a rich man's consumption, it is undeniable that it may be so directed as to call into existence profitable instead of worthless industry, and thus to become a beneficent instrument of civilization to all those within the sphere of its power. In the ruder stages of society such an influence stands in the place of liberal endowments for education; and prepares the way for that general spread of intelligence which probably requires higher and more permanent incentives towards perfection than any individual influence, however great. When a country possesses zealous as well as numerous teachers of religious truths, ample establishments for public instruction, a wholesome and widely-spread literature, and ready and cheap communication, the moral influences of a benevolent resident landlord will be scarcely more felt than the example of any other wise and good man. But in a country far short of this high state of civilization, the possessors of property have duties to discharge which cannot easily be deputed, and certainly not safely neglected. It is this which makes the question of absentees, as regards Ireland, so difficult to treat upon principles of political economy alone. The absence of the principal landholders of that country must, morally considered, be a very serious evil; but it is an evil not without mitigation. The necessity for a large exportation of the products of the industry of Ireland to support her absentee expenditure, calls into action a great quantity of profitable labour, to meet the wants of the English market in the most beneficial manner to the producer. The exportation of eggs from Dublin to Liverpool alone amounts, at one halfpenny each, to more than 50,000*l.* a year, and that of poultry is equally considerable. This impulse to the industry of the small tenantry, by exchange with England, will probably, in time, do as much as the residence of the landlords of Ireland could do to raise her peasants from the condition of miserable cottiers to that of independent yeomen. It will unquestionably do more than the presence of a debauched and even careless landlord, such as Miss Edgeworth has described in *Castle Rackrent*, who was wont to swallow up the few crumbs which his larger exactions left his dependents, in the shape of *duty* eggs and *duty* fowls.

[See M'Culloch's Evidence before the Select Committee on the State of Ireland, 1825, Fourth Report, pp. 813-14-15; also his Evidence before the Select Committee on the State of the Poor in Ireland, 1830, p. 592, &c.—Leslie Foster's *Essay upon Commercial Exchange*, 1804, quoted in the last-mentioned Report, p. 597—Say, *Cours Complet d'Economie Politique*, tom. v. chap. 6—Chalmers on *Political Economy*, p. 200, 1832—*Quarterly Review*, vol. xxxiii. p. 459, for an hostile examination of Mr. M'Culloch's opinions.]

ABSOLUTION, a religious ceremony in use in different Christian communities, by which the priest declares an individual, on repentance and submission to the requisite penance, to be absolved either from his sin, or from the ecclesiastical punishment or deprivation to which it had rendered him liable. It is contended by many theological writers, that down to the twelfth century the priest in this act only used the words 'May God, or may Christ, absolve thee;' thus refraining from claiming any authority to remit the sin himself. Since then, however, the formula used in the Roman Catholic church has been *Ego te absolvo a peccatis tuis* (I absolve thee from thy sins), accompanied with the sign of the cross. The Council of Trent has expressly condemned the doctrine that the priest has not power of himself to absolve from the guilt of sin. (Session xiv. Canon 4.) The Church of England also holds, as may be seen in the Order for the Visitation of the Sick, that power has been left to the church to absolve repentant sinners; and the words which the minister uses in performing the ceremony are nearly the same with those employed in the Catholic communion, 'I absolve thee from all thy sins.' It has, however, been maintained by some that the absolution thus bestowed is only declaratory, while that pronounced by the Catholic priest is professed to be absolute, and to proceed solely from himself. In the Greek church the formula is merely declaratory; that is to say, it is of the nature of a prayer to heaven that the sins of the penitent person may not be visited with their due punishment. It is so also in the Protestant Church of Scotland; and there the term absolution is commonly used to denote simply the declaration of the Kirk-Session or other judicatory, expressed by the mouth of its president, that the party is released from the ecclesiastical interdict to which his delinquency had subjected him.

ABSORPTION, from *absorbeo*, to suck up. The function of absorption is one of the most curious and important of the animal economy. The matter of which the living body is composed is in a state of continual change: old particles are every moment taken from their situation and carried out of the system; new particles are every moment conveyed to the place occupied by the old and deposited in their room. The constituent matter of the living body is, therefore, never exactly the same in two successive moments. This change of the constituent matter of the living body is effected by the process termed absorption, and the agents by which this process is carried on are the absorbent vessels. The absorbent vessels possess a peculiar structure essentially different from that of arteries, veins, or any other vessels of the body, and their action likewise is altogether peculiar. The absorbent vessels consist of two distinct sets. The first arise from the alimentary canal, and more especially from the small intestines. They absorb the digested aliment, and are the instruments by which the new particles of matter, which are necessary to supply the loss occasioned by the removal of the old, are carried into the system. This new matter, which is termed CHYLE, is of a white colour, very much resembling milk; and these vessels, when full of it, have the appearance of minute tubes distended with a milky fluid; hence they are called LACTEAL VESSELS, (that is, milk-vessels.) The other set arise from every part of the body,—from the whole of its external surface,—from the whole of its internal surface,—from every one of its tissues,—from every one of its organs,—so that the point of the finest needle can touch no part of the body without coming into contact with a branch of this system of vessels. At every point of the body these vessels are always at work, taking up and carrying away the old and worn-out particles. But, further, those which are spread out on the external skin, and those, also, which are spread out on the internal skin, on the membrane which lines the air passages, for example, and on that which lines the passage to the stomach, are capable of taking up many foreign substances which may come into contact with them, and often powerfully affect the system by introducing into it these foreign bodies. Whatever be the nature of the substance contained in this second set of vessels, and from whatever source it be derived, it is always without colour when received into the vessel, and perfectly transparent and pellucid; on this account it is termed *Lymph*, and these vessels are, therefore, called LYMPHATICS. The LACTEALS then contain new matter derived from the digested aliment: the LYMPHATICS contain the old and worn-out particles of the system, together with whatever substances may have been taken into it from the surfaces of the body. The structure and the course of these vessels, and the agencies by which they receive and circulate their contents, will be treated of under the terms LACTEAL and LYMPHATIC VESSELS.

Of the real existence and the active operation of the function of absorption there is indubitable proof.

1. In the first place, in certain states of the system, there is a wasting of the flesh, a dissipation of the solids, a diminution of the weight of the body; under other circumstances, while the general system remains unaffected, particular parts of the body diminish in size, or even disappear altogether. These phenomena are not dependent on any external influence, and cannot be referred to the action of any physical agent. They can be accounted for only on the supposition that processes are constantly going on within the body, which remove from the system both the solid and the fluid parts of which it is composed.

2. In the second place, if fluids be injected from without into the internal cavities, or if they be effused in the progress of disease, these fluids disappear sometimes spontaneously, and still more often under the influence of particular medicinal substances. An opening was made into the cavity of the abdomen of a living animal; three quarts of water were injected and secured; in six hours after this operation the animal was killed, and the state of the abdomen was examined; not more than four ounces of the water remained. Oftentimes, after digitalis or fox-glove has been taken some days in succession, large collections of water in the different cavities of the body disappear in the course of a few hours.

3. In the third place, various substances, when placed in contact with a living surface, produce the same effects upon the system as when received into the stomach, or injected into the veins. Arsenic, when applied to an external wound, will sometimes affect the system as rapidly and as powerfully as when introduced into the stomach. A strong infusion of tobacco, when applied to the pit of the stomach, will occasion vomiting, when injected into the rectum will produce almost immediate fainting, and unless care be taken this fainting will end in death. These phenomena can be accounted for only by supposing that the substances in question are really conveyed into the system.

Many facts testify the action of cutaneous or external absorption. It is proved by direct experiment, that the human hand is capable of imbibing, in a quarter of an hour, an ounce and a half of warm water, which, for the whole body, is at the rate of six or seven pounds per hour. An interesting narrative is on record of a ship's crew who were exposed at sea for several days in an open boat; they had consumed all their water; they had no fluid of any kind which they could drink; they soon began to suffer from thirst; the feeling at length became intolerable, and the drinking of sea-water was found only to increase its intensity. When nearly exhausted, they were exposed, during several hours, to a heavy shower of rain. As soon as their clothes became thoroughly wet their thirst began to abate, and before the rain had ceased their thirst was gone. They did not fail to profit by this experience. From this time each man, as soon as he began to feel thirsty, dipped his shirt in the sea-water and wore it next his skin, which had invariably the effect of removing his thirst, the absorbents taking up the particles of water, but rejecting the saline matter dissolved in it.

The function of absorption explains many phenomena connected with health, with disease, and with the action of remedies. The agents which produce disease, and especially the widely-extended and powerful causes of fever,—namely, animal and vegetable matter in a state of decomposition; these, together with the effluvia of marshes, exhalations from the animal body itself, and perhaps other noxious gases diffused in the atmosphere, afford striking illustrations of its operation. An exposure but for a few minutes to an atmosphere loaded with marsh effluvia, of an intensely noxious nature, may produce a protracted ague, or even instantaneous death. Even a few inspirations of an atmosphere, rendered foul by exhalations from the human body, may produce, in a person previously healthy immediate nausea and vomiting, followed by severe and pernicious fever. A person labouring under small-pox may contaminate the air of a room to such a degree that a healthy person, breathing this air but for a short space of time, may become affected with the disease, although the infected may never have come into actual contact with the infecting person. In all these cases a poison is diffused through the atmosphere, which comes into contact with the surfaces of the body, and so affects the system through the medium of absorption. The free dilution of this poison with pure air will destroy, or render innoxious, these malignant agents; hence, persons who are under the necessity of remaining constantly in the chambers of the sick may remain there with perfect impunity, if these chambers are frequently and thoroughly ventilated; while, if ventilation be neglected, or imperfectly performed, not only is the disease of the patient aggravated, and perhaps by this cause alone rendered mortal, but his nurse also is sure to suffer; hence the value of this further fact, which cannot be too constantly borne in mind, that these noxious agents always affect the system exactly in proportion to its want of energy. Exposure to a powerful noxious agent,—when the stomach is empty,—when the body is exhausted by fatigue,—when the mind is depressed and desponding,—will occasion a mortal disease; exposure to this very same agent, when the body is well nourished,—when the functions are carried on with vigor,—when the mind is cheerful and confident,—will be attended with no appreciable effect. There is no kind or degree of sickness with which a family or an individual can be affected, in the management of which the knowledge of facts of this kind may not afford useful suggestions; but this knowledge is of paramount importance when malignant and mortal epidemics attack a village, a city, a district, or a nation.

Nor is there less practical utility in attending to the action of absorption in relation to noxious agents which are generated within the body itself. When secretion is vitiated, and the morbid matter is absorbed by the lymphatics,—when digestion is imperfect, and unwholesome chyle is absorbed by the lacteals,—when the excretory portion of the alimentary canal is torpid, and the fæcal matter which ought to be carried out of the system is retained there and in part absorbed,—in such cases, the sensible qualities of the perspiration, the odour of the breath, the foul state of the skin, the loss of strength, the irritable and feverish condition of body and mind sufficiently declare the disorder of the system. Considerations such as these show the value of pure air, simple and easily digested food, moderate and regular exercise, purgative medicines, and remedies of the class termed alterative. By alterative remedies we mean medicinal substances that are absorbed from the surface of the alimentary canal, that enter the current of the circulation, that are conveyed by this channel to secreting organs, and that, by their influence over the actions of these organs, effect a salutary change in the general functions of the body.

ABSTINENCE, from *abstineo*, to abstain. The term abstinence signifies a total, or an excessive privation of food. It has been shown (see Absorption) that the constituent matter of the body is in a state of continual change,—that old particles are constantly taken up and carried out of the system, while new particles are as regularly deposited in their room to repair the loss. The source of these new particles is the aliment or food; but a second office is performed by the aliment scarcely less important than that of furnishing new matter for the renovation of the system. All the organs of the body are excited to the performance of their functions by certain external agents, which are called stimulants; such as air, water, heat, and so on; but of these stimulants the aliment is among the most indispensable and the most powerful. Upon the quantity and quality of the aliment depend the quantity and quality of the blood, and upon the quantity and quality of the blood depends in a great measure the energy of all the functions of all the organs. Any material change in the diet must necessarily produce a powerful impression on the system. Life can be maintained but for a short period under the total privation of food, while the excessive privation of it produces effects upon the system which have not been often observed with accuracy, but which are remarkably uniform, and highly curious and instructive. Opportunities occasionally occur of noting those effects with correctness and completeness, when, for example, the passage to the stomach is closed up by disease; or when, owing to an unsound state of mind, the individual refuses to take nourishment.

During the first two or three days after the total abstinence from food, in a person previously in sound health, the suffering from hunger is generally severe. The thirst is also at times distressing, but thirst is not constantly attendant. The pulse during this period remains natural, and so does the temperature of the body. All the evacuations are scanty, and take place at distant intervals. After the first two or three days the wasting of the body becomes visible, the fresh colour characteristic of health disappears, and the features and the limbs, instead of being plump and round, are sunk and collapsed. The loss of weight, which increases rapidly, is appreciable, and the progress of the emaciation is striking. The physical debility increases in exact proportion with the emaciation: and the mind becomes weak, confused, wandering, irritable, and at length almost deprived of reason. All this time there is little or no pain from hunger or thirst, or these uneasy sensations return only at intervals, and are seldom acute and never lasting. The pulse at this stage may be a little quickened; it is certainly easily excited; and in like manner the heat, which seldom sinks below the natural standard, is readily parted with,—so that a slight change of the temperature of a room is felt acutely, and produces very uneasy sensations, a fact which demonstrates to the physician the feebleness with which the functions are carried on, no less clearly than the physical debility itself. The most remarkable and curious phenomena which next supervene are those connected with the intellectual faculties. The loss of power to perceive accurately, and to connect the trains of thought, is followed by decided delirium, which is at first of a low muttering character, similar to that which takes place in the last stage of typhus fever; but this sometimes passes rapidly into furious and even maniacal delirium, requiring coercion just as a violent paroxysm of madness itself. Generally the delirium is preceded by a state of painful watchfulness and restlessness, it being impossible to procure sleep or quiet; and, finally, the skin becomes intensely hot, the pulse extremely rapid, the emaciation frightful, the debility so great that scarcely the slightest movement can be performed, and at length the individual sinks exhausted, commonly into a state of stupor amounting to that complete and profound insensibility which is technically called Coma.

This history of the progressive changes which take place in the system on the total abstraction of food, is illustrated in the most perfect manner, by two cases which fell under the notice of physicians capable of accurately observing and duly appreciating each successive event. Many wonderful stories are on record, of the truth of which there is no sufficient evidence; but the cases to which we refer were observed and recorded by men whose veracity is beyond question, and who were endowed with more than ordinary discrimination and judgment. The record on this account is invaluable, while in itself it is highly curious and instructive.

For the first case we are indebted to Dr. Currie, of Liverpool, the author of an admirable work on the application of cold as a remedy in certain cases of fever. In August, 1795, a gentleman of Yorkshire, aged sixty-six, applied to this physician for his assistance, on account of an obstruction in his swallowing food, with which he had been afflicted for ten or twelve months. At first the complaint was slight; it occurred only when he attempted to swallow dry and hard substances; it afterwards extended to solids of every kind; and, at the time he was first seen by his physician, although he was still able to pass down liquids, the quantity he could swallow was not sufficient for his nutrition, and he was considerably reduced. On the introduction of a bougee into the gullet, it passed about two inches easily, but then met with an obstruction which, by a moderate pressure, was overcome. It then passed easily seven or eight inches more, but, at the lower part of the tube towards its termination in the cardia, it met with a firm resistance, which no patience or skill could surmount. This obstruction proceeded from a schirrous tumour, which, gradually increasing at first, diminished the passage, and at length closed it wholly.

On the evening of the 17th of October a sudden increase of the obstruction came on, and from this time he was able to swallow only a table-spoonful of liquid at a time, and at long intervals. It was with difficulty that he got down seven or eight spoonsful of strong soup in the day, and this quantity gradually diminished. On the thirteenth day from this sudden increase of the obstruction, the passage appeared to be wholly closed.

The patient himself, to the last, was far from despairing of his recovery; and the affectionate friends around him, though they could not but see the issue of the case, yet desired that his life might be prolonged to the uttermost. The following plan was, therefore, adopted with this view. Every morning a clyster was administered, consisting of eight ounces of strong broth, made chiefly of the membranous parts of beef, these being considered the most nutritious, into which were rubbed two yolks of egg, and to which were added forty drops of laudanum. This was repeated in the afternoon, and again in the evening, previously to which, in the evening, he was placed up to the neck in a tepid bath, of which one-fourth was milk, and the rest water; the whole quantity amounting to twenty-four gallons. The temperature was fixed at 96°, to accommodate his sensations, and the time of immersion was gradually prolonged from forty-five minutes to an hour.

After a few days it was found that the retention of the rectum improved, so that the clysters were enlarged to ten ounces of broth, and three yolks of eggs each; to which were added eight ounces of white wine, and the laudanum, which was added to the evening clyster, was gradually increased from sixty to two hundred and fifty drops. Thus the whole of his nutriment for twenty-four hours consisted of thirty ounces of broth, twenty-four ounces of wine, nine yolks of eggs, and from 250 to 380 drops of laudanum, and administered by clyster; with what liquid might be supposed to be taken up in the bath by the absorbents of the surface of the body.

When in tolerable health at the commencement of his complaint, this gentleman, who was a tall man and naturally corpulent, weighed 240 lbs. Before the obstruction had become complete, imperfect nutrition had reduced him to the weight of 179 lbs. In twenty days, from the period of the sudden increase of the obstruction, he was reduced to 154 lbs.; on the twenty-fourth day he had lost 5 lbs. more; and at the period when his delirium commenced, that is on the thirty-second day from the night that he ceased to swallow, he weighed 138 lbs., having lost upwards of 100 lbs. of his original weight. He lived four days longer, that is, thirty-six days from the period when the obstruction was supposed to be complete; but, during these last four days, no nutriment, in any form or of any kind, was administered; for the rectum no longer retained the clysters, and the administration of the bath appeared, under these circumstances, to be wholly useless.

For a month after the total obstruction of the passage, the temperature and the pulse were natural; but on the thirty-second day the pulse became small and frequent; on the following day the eyes lost their common direction, the axis of each being turned towards the nose; he complained that he sometimes saw double, but the sensibility of the retina was increased rather than impaired; for, on the admission of the light of the window, he screamed out, though he had before been accustomed to this light. On the next day there was considerable incoherence of mind; this incoherence passed rapidly into delirium, during the prevalence of which there was a perpetual and indistinct muttering, with great restlessness and agitation; the skin and the extremities were sometimes of a burning heat, and sometimes clammy and cold; the pulse became feeble and irregular; the respiration, which hitherto had been singularly undisturbed, became laborious; and in ninety-six hours after the clysters and all other means of nutrition had been abandoned he ceased to breathe.

During the whole of this melancholy progress to inevitable death, this unfortunate gentleman complained very little of hunger: occasionally he expressed a wish that he could swallow, but not often nor anxiously; and, when questioned on the subject of his appetite, he always declared that he had no hunger which occasioned any uneasiness. The clysters evidently relieved the sense of hunger, and the opium they contained seemed to have a powerful share in producing this relief. It occasioned quiet and rest after each clyster, and allayed every kind of desire or appetite. Neither was he much disturbed with thirst. This sensation was, indeed, troublesome during the first days of his abstinence; but it abated, and, as he declared, was always removed by the tepid bath, in which he had the most grateful sensations. His spirits were uncommonly even, and his intellect perfectly sound. He occupied himself a good deal in his private concerns; and, as usual, interested himself in public affairs. In order to husband his strength he was confined a good deal to bed; but, till the last few days of his life, he dressed and undressed himself daily, and walked not only about his room, but through the house. His nights were quiet; his sleep sound, and apparently refreshing. Just before his delirium set in he had very lively dreams, which were all of a pleasant nature; and, in the last conversation he had with his physician, he told him he had had a very gay evening with two Yorkshire baronets whom he named; that they had pushed the bottle about freely; that many jokes had passed, at the recollection of which he laughed heartily, a thing uncommon with him; but it was observable that he was unable, longer than a moment or two, to distinguish this scene which had passed in sleep from a real occurrence; and this state of mind lapsed into delirium from which he never recovered. At this period he was so weak as to be scarcely able to turn himself in bed, to which he had been entirely confined several days, previously to his death.

The second case, which is no less interesting, occurred to Dr. Willan. A young man of a studious and melancholic turn of mind was affected with symptoms of indigestion, particularly with sharp pains in the stomach and a constant sensation of internal heat, for the relief of which he thought proper to begin a severe course of abstinence, hoping by this means, as he said, to remove his disagreeable complaints; but there was reason to believe that some mistaken notions on the subject of religion principally induced him to form this resolution. Having taken his purpose, he suddenly withdrew from business and the society of his friends, took lodgings in an obscure street, and entered upon his plan, which was to abstain from all solid food, and only to moisten his mouth from time to time with water slightly flavoured with the juice of an orange. After three days of abstinence the craving or desire for food, which was at first very troublesome, left him entirely; he then pursued his studies and meditations without further inconvenience; he used no manner of exercise; he slept very little, spending most of the night in writing; he consumed from half a pint to a pint of water daily, into which he squeezed the juice of the orange to give it an agreeable flavour. He persisted in this plan with firmness fifty-one days. During the succeeding ten days his strength failed rapidly; he was no longer able to rise from his bed: hitherto he had flattered himself that his support was preternatural, and indulged his imagination with the prospect of some great event which he expected would follow this extraordinary abstinence, but now that he found himself sinking to the grave his delusion vanished. About this time his friends discovered his retreat, and he was prevailed upon to assent to any plan that might be conducive to his recovery. He was seen by Dr. Willan on the sixty-first day of his fast: at that time he was emaciated to a most astonishing degree; the muscles of his face were entirely shrunk; his cheek bones stood prominent and distinct, affording a most ghastly appearance; the abdomen was concave, from the collapsed state of the intestines; the limbs were reduced to the greatest possible degree of tenuity, and the processes of their bones were easily distinguishable. His whole appearance suggested the idea of a skeleton prepared by drying the muscles upon it in their natural situations. His mind had become imbecile. He had undertaken during his confinement to copy the Bible in short-hand, and this work he had executed very neatly as far as the second book of Kings, with short arguments prefixed to each chapter. He showed his physician several improvements he had made in that kind of writing, particularly in the abbreviations. He had also, with great diligence, put together parallel passages, and traced particular subjects through the whole Scriptures, noting their application in different instances, and adding observations of his own. He appears at first to have proceeded in this undertaking with considerable ingenuity and judgment; but afterwards he became obscure, and seemed to be lost in endless confusion.

Unfortunately the treatment adopted was injudicious, the quantity of food allowed him being much too large; yet, for the first few days, he appeared to improve, regaining flesh and strength, and acquiring firmness and even cheerfulness of mind; but on the night of the fifth day he was sleepless and restless; on the morning of the sixth he began to lose his recollection, and before midnight he was quite frantic and unmanageable; at the same time his pulse was increased in frequency, with considerable heat of the skin, and tremors. During the following day he continued raving, and talking very incoherently, as he had done during the preceding night. He remained nearly in the same state, scarcely ever sleeping and taking very little nourishment, his pulse becoming daily smaller and feebler, and beating at length 120 strokes in a minute, and his emaciation still increasing, until the eleventh day from the period that he began to take food and medicine, and the seventy-second from the commencement of his abstinence, on which day he died, quite exhausted.

There is no authentic case on record in which the duration of the abstinence was as long as this, and both these cases taken together afford an excellent history of the disorder of the functions, and the exhaustion of the powers of life on the total and continued abstraction of food. The mind in the first case was naturally firm and strong; in the second it was supported by an enthusiasm amounting to insanity. When the mind is feeble, and especially when it is under the influence of fear, anxiety, despondency, or any other depressing cause, the duration of life is greatly abridged. It is instructive to observe the absence of severe suffering from hunger and thirst; the absence of all acrimony of the fluids; the absence of all violence and turbulence of mind until delirium set in, the precursor of death.

From the powerful influence of abstinence on the system, it is obviously capable of becoming a most energetic remedy in various diseases. When the mass of the fluids and solids of the body is too abundant, abstinence is capable of reducing them to almost any extent that can be required; and if the abstinence be judiciously commenced and conducted, not only is it unattended with any diminution of the strength or injury to the health, but it contributes to the improvement of both. Numerous instances are on record which place this fact beyond question. The case of Cornaro the Venetian nobleman, and that of the Essex miller, which afford evidence of this more complete than it would be easy to invent, are universally known. The body, whatever be its bulk or weight, provided the health be in other respects sound, may be reduced to almost any degree of thinness, and kept at that point by an appropriate regulation of diet and exercise. The physician, at his pleasure, can make no one fat, but he can make any one as thin as he chooses, frequently improving at the same time the health and vigour both of body and mind. Seldom is he called upon to put this art into practice, and seldomer than he ought does he insist upon carrying it into practice; but it is something to know that the resources of his art place this in his power.

In all acute diseases, such as the various forms of fever and inflammation, abstinence is a most powerful remedy, not only because the abstraction of nutriment diminishes the mass of the fluids and solids, (since the process of absorption goes on though the supply of new matter is stopped,) but also because it withdraws one of the main stimulants of the system, and consequently subdues the increased actions which accompany, and which for the most part constitute, acute diseases.

In some chronic maladies, especially in that large class which depend on what is termed plethora, that is, too great a quantity of solids and fluids, particularly in the plethoric state of the blood-vessels of the brain predisposing to and producing apoplexy, in some morbid affections of the stomach itself, in some derangements of the liver, and in several diseases of the heart, abstinence is an invaluable remedy. In other chronic diseases it is injurious, as in diseases of debility, in diseases which depend on irritation in contradistinction to those which depend on inflammation, and in various nervous maladies.

Abstinence is not equally well borne by all persons, nor at all times by the same person. By the corpulent and plethoric it may be endured longer, and carried farther, than by the thin and the spare: in the middle or mature age, it is less injurious than in infancy, youth, or extreme old age. A degree and duration of it, which are highly beneficial in a fever or an inflammation, would be fatal in the state of health.

It is curious, and it is highly important to bear in mind, that abstinence and excess produce symptoms so nearly alike, that it often requires the utmost care and sagacity on the part of the physician to distinguish the one case from the other; and as the one requires opposite remedies from the other, a mistake may be fatal, and must be injurious. A man, addicted to drunkenness, was cast into prison for theft, and reduced, at once, to a diet of bread and water. After the first week, a disorder of the intellectual faculties took place; his countenance became pale and expressive of languor, his flesh wasted, and his strength declined; his nights were sleepless; shortly afterwards there was delirium, which was mild at first, but subsequently furious. These symptoms might have been easily mistaken for those which denote inflammation of the brain; but the true nature of the affection was discriminated, and brandy was administered. Immediately the affection of the brain disappeared, and the flesh and strength returned.

Some time ago an alarming epidemic broke out in the Milbank Penitentiary, London. The prisoners confined in this prison were suddenly put upon a diet, from which animal food was almost entirely excluded. An ox's head, the meat of which weighs eight pounds, was made into soup for one hundred people, which allows one ounce and a quarter of meat to each person. The prisoners were at the same time subjected to a low degree of temperature, to considerable exertion, and were confined within the walls of a prison, situated in the midst of a marsh, which is below the level of the adjoining river. The consequences were, first, loss of colour, of flesh, and of strength; next, this simple debility of constitution was succeeded by various forms of disease—scurvy, dysentery, diarrhœa, low fever; and, lastly, affections of the brain and nervous system—namely, headache, vertigo, delirium, convulsions, apoplexy, and even mania. When bleeding was tried, the patients fainted after losing five, four, or even fewer ounces of blood. Abstinence will sometimes produce a train of symptoms exactly similar to those of the disease which it is employed to remove. Persistance in the abstinence will aggravate the malady, which will baffle every mode of treatment as long as the abstinence is persevered in; but which will disappear with surprising rapidity on the administration of a generous diet. This is especially the case with those affections of simple irritation which assume the appearance of inflammation, and which are attended with headache, noise in the ears, giddiness, restlessness, sleeplessness, and delirium. A professional man was seized with fever; rigid abstinence was enforced, not only during the continuance of the fever, but also during the stage of convalescence. Delirium, which had been present in the height of the fever, recurred in the convalescence. A physician of eminence in maniacal cases was consulted, who recommended him to be removed to a private asylum. Before this advice was carried into effect, another physician saw him: a different treatment and regimen, with a gradual increase of nourishment, were adopted; the patient was well in a few days, and within a fortnight returned to his professional avocations.

It is the common belief that abstinence is conducive to longevity, and many stories are on record which are conceived to establish the truth of this opinion. It is stated, for example, that the primitive Christians of the east, who retired from persecution into the deserts of Arabia and Egypt, lived healthfully and cheerfully on twelve ounces of bread per day, with mere water; that, with this diet, St. Anthony lived 105 years; James the Hermit, 104; Arsenius, tutor of the Emperor Arcadius, 120; St. Epiphanius, 115; Simeon the Stylite, 112; and Romauld, 120: to which are added many others. But we should remark that the evidence for these instances of longevity may not be quite satisfactory.

The quantity of food absolutely necessary to support the functions of life in vigor, is not known with any degree of exactness. Probably it varies with every constitution, and with every situation and circumstance that modify constitution. Provision is made in the economy for carrying out of the system superfluous nourishment, so that, within certain limits, more than is absolutely requisite is not injurious. Excess, without doubt, is always pernicious, and its direct tendency is to produce disease and to shorten life. For one person, however, who abridges the term of his life by excess, a hundred die prematurely from the want of a sufficient quantity of nutritious food. Persons who live in the bad air of a city require a larger quantity of food, and that of a more nutritious quality, than those who breathe the pure air of the country; and those who labour, physically or mentally, need a corresponding augmentation of food, in order to compensate the expenditure of the system. Persons in sound health, with a good constitution, having a tranquil mind, leading a quiet, contemplative life, without physical or mental labour, in a pure air, and taking regularly a good portion of sleep, may subsist a long time on very little food. And such seems to have been the condition of the Eastern Christian ascetics, whose abstinence and longevity have been so much celebrated. But, even under such circumstances, the processes of life are attended with a certain amount of expenditure, for the compensation of which a certain quantity of food is requisite, and without a supply of which the duration of life must be inevitably abridged. Both the physical and the mental states here supposed are precisely those, however, in which too large a quantity of food would prove more injurious than too small a quantity. In a word, in a state of health, abstinence is always pernicious, and temperance always beneficial; while, in a state of disease, abstinence is often beneficial, and temperance itself injurious, because what is temperance in health is excess in sickness.

Nothing can remedy the morbid condition induced by long continued abstinence, but food; yet nothing will more certainly or more rapidly extinguish life, than the administration of food, unless it be given with the utmost caution. If a person, after having been long exposed to severe cold, be placed close to a large fire, or be brought at once into a warm room, he will sustain grievous injury, and perhaps die; and, in like manner, if a large quantity of nutritious food be poured into the stomach of a person who has been exhausted by long abstinence, the feeble spark of life that may remain will certainly be extinguished. In Dr. Willan's case, three pints of food,—a pint of milk for breakfast, a pint of mutton-broth boiled with barley for dinner, and as much rice-milk for supper,—were allowed on the third day after an abstinence of sixty days! No wonder that all the symptoms were immediately aggravated, and that the condition of the patient soon became hopeless. One-third of this quantity would have been far too much. To have allowed milk at all was bad, because milk becomes solid in the stomach, and is then more difficult of digestion than other solids, from being unmasticated. In cases like this, a little thickened broth should be given every three or four hours, and the quantity very gradually increased; subsequently, animal food may be allowed; warmth should be promoted by every expedient; frictions are useful auxiliaries, and the bowels should be aided by the occasional use of mild clysters. Internal stimulants are seldom needed; when given at all, the best are ammonia, camphor, the vegetable bitters, and tonics, with small quantities of some anodyne.

ABSTRACTION is an act of the mind, by which it considers a certain attribute of an object, or several objects, by itself, and without regarding any other attributes which the object or objects may happen to possess. Thus, if we see ink, pitch, ebony, and a negro, we see that these objects have in common the attribute of blackness; and this quality we can in thought *draw off* or *abstract* from the various other attributes which they respectively possess; and consider it separately and independently of anything else. In like manner we can consider any attribute of a single object, such as of the sun or moon, without attending to its other attributes; thus we may contemplate the magnitude of the sun without attending to its heat, light, &c.: so we may contemplate the light of the moon, without attending to its magnitude, the inequalities of its surface, &c. All names of classes, inasmuch as the individual members can never be identical, are formed by a process of abstraction. Thus, when we think of a ship or a house, we pay no attention to the materials, colour, shape, size, construction, convenience, or beauty of the ship or house, but we give the one name to any dwelling of man built by regular artificers, and the other to any vessel with a deck and masts made to sail on the sea. Any object which possesses these attributes we call a ship or a house; though there cannot be any ship or house which possesses *only* those attributes, and is not also of a certain colour, size, shape, &c.: but these incidental qualities we leave out of our consideration in referring any object to the class of houses or ships.

From these remarks it is evident that abstraction, being a merely arbitrary act of the mind, by which a certain attribute is considered apart from any other attributes with which it may happen to be associated, does not represent to us images or notions to which there is anything corresponding in the nature of things: there is nowhere an abstract man or tree which has no colour, dimensions, or other incidents not entering into the abstract notion signified by those general terms. Whenever we recognize in any object those peculiarities which we consider as characteristic of a certain class, we refer it to that class, without taking any heed of the *other* attributes with which they may happen to be combined. Thus, if in some unexplored part of the world there should be discovered a race of animals resembling some known variety of the human race in every particular except the colour of the skin or the hair, they would be doubtless called men, although there is no such thing as an abstract man whose skin or hair is devoid of colour.

The circumstance of there not being any sensible object, or any conception of our mind, which we can image to ourselves without its attributes, has given rise to considerable perplexity on the subject of abstraction. For instance, when we think of a horse, we represent to ourselves an animal of certain colour, shape, and size; though we should equally give the name of horse to an animal of different colour, shape, and size. So, when we think of a plane triangle, although a triangle is any plane figure bounded by three straight lines, yet we cannot help representing to ourselves a triangle which is either right-angled, or acute-angled, or obtuse-angled, or equilateral or scalene. The truth is, that the process by which the mind abstracts is, that it conceives or represents to itself the object of thought as an individual of its class, together with certain particular attributes which must belong to all individuals; and it considers apart from the rest only that attribute which is required for the matter in hand. Thus, if it is a question whether a newly-discovered skeleton is that of an animal belonging to the class of elephants or of deer, the comparative anatomist calls to his mind an elephant or deer, such as actually exists, but *considers* only the structure of his bones; and, if there is a close agreement in this respect, he pronounces the skeleton to have belonged to one of those classes. So, likewise, when a mathematician, by means of a figure described on paper, proves that the square of the hypotenuse equals the sum of the squares of the other sides of a right-angled triangle, although the image in his mind is that of a triangle of a definite size, yet he considers only the relation of the sides and angles, without paying any attention to the length of the lines.

This process, by which the mind *generalizes* a particular notion, by considering only a part of it, might be illustrated by many examples of changes in the meaning of words. Thus, there stood formerly on the bank of the Thames in London, a palace called Bridewell; this, in the reign of Elizabeth, was converted into a penitentiary, or prison for hard labour: whence the term *bridewell* has been extended, and is now sometimes used as a general name for such penitentiaries. So the name *palace* has been extended to all sumptuous houses, having originally been confined to that on the *Palatine* hill, at Rome. It has been remarked that, although brute animals have, like men, the faculty of reasoning or drawing conclusions from premises, yet they have not, like men, the faculty of abstraction. Nevertheless, it is plain that some animals go through a process of which the effects exactly correspond with that of abstraction in men: for example, they can count, and are aware of the recurrence of certain numbers; and a dog who has once been beaten with a stick, or pelted with a stone, will run away from all sticks or stones, of whatsoever size, shape, or colour. That they cannot found, on abstraction, the admirable gift of language, the most important distinction between men and beasts, is owing apparently not to the absence of the power of forming general notions, nor yet to the inability of making articulate sounds, as we may perceive in the instance of the parrot.—See NOMINALISTS and REALISTS.

ABSURDUM, REDUCTIO AD, is that species of argument which proves not the thing asserted, but the absurdity of everything which contradicts it. It is much used in Geometry, in order to demonstrate the converse (see CONVERSE) of a proposition already proved. One of two things must be true; either the proposition asserted, or something which contradicts it. If the opposing party denies the proposition, he must affirm that which is contradictory. Let his counter-proposition be taken for granted: then, if, by the legitimate use of it, some absurdity can be deduced, it is evident that his contradiction is wrong, and the original proposition right. As an instance of this method of proceeding, let us suppose it has been proved, and is not denied, that whenever A is B, then C is D. We may then affirm that when C is not D, A is not B. For if A were B, C would be D; but C is not D, therefore A is not B. The strict form of the *reductio ad absurdum*, in this case, is as follows:—You grant that if A were B, C would be D; but you refuse to admit the consequence that, when C is not D, A is not B; that is, you say that C may not be D, and yet A may be B. Let this, then, be as you say, that is, let C not be D, and yet let A be B, But in supposing that A is B, the admitted proposition obliges you to say that C is D. But you have supposed that C is not D, you therefore say at the same time that C is D, and that C is not D, which is absurd. Consequently, if it be true that, whenever A is B, then C is D, it follows that, when C is not D, A is not B.

The *reductio ad absurdum* has been objected to as not equally conclusive with direct demonstration. For this there is no foundation; though it must be admitted that direct demonstrations are more pleasing and more elegant. But it is obvious that, if everything which contradicts a proposition be false, the proposition itself must be true. The student of logic must distinguish between that which is only *contradictory*, and that which is *contrary* to a proposition. Thus, to the proposition that 'all squares are equal,' it is contradictory that '*some* squares are not equal,' and contrary, that '*no* squares are equal.' The contrary is the most complete contradictory, and affirms that the proposition is true in no one instance. It is not correct to say that, if a proposition be false, its contrary is true; for example, it is false that all squares are equal, and equally false that no squares are equal. But of a proposition and its contradictory one must be true; thus, either all squares are equal or some squares are not equal. Hence, whatever disproves a proposition proves something contradictory, and whatever disproves everything contradictory proves the proposition. The *reductio ad absurdum* is, therefore, as conclusive as direct demonstration.

ABU BEKR, properly called ABDALLAH ATIK BEN ABI KOHAFAH, but better known under the name of ABU BEKR (*i.e.* 'Father of the Maiden,' in allusion to his daughter Ayeshah, whom the Arabian prophet married very young), was the first caliph or successor of Mohammed in the government of the new empire founded by him. Mohammed died in A.D. 632, without leaving male issue. The succession to the sovereignty was at first contested between his father-in-law, Abu Bekr, and Ali ben Abi Taleb, his cousin-german, who was also, through marriage with the prophet's daughter Fatima, his son-in-law. Between the two rivals themselves the dispute was settled without an appeal to arms. Abu Bekr prevailed, and Ali, though disappointed, submitted to the authority of his successful opponent. But among the Mohammedans the respective claims of the two competitors became a point of perpetual controversy, and gave rise to the great division of the whole Mohammedan community into Sunnites and Shiites; the former asserting the right of Abu Bekr and his two successors, Omar and Othman, while the Shiites condemn these three caliphs as unlawful intruders, and maintain the exclusive right of Ali ben Abi Taleb and his lineal descendants to the commandership over the Faithful.—[See article ALI BEN ABI TALEB.]

After the death of Mohammed, several of the Arabian tribes, who had become converts to the religion promulgated by him, shook off their allegiance to his successor. Only the three important towns of Mecca, Medinah, and Tayef declared themselves for Abu Bekr. It was the first and principal object of the newly-appointed sovereign to establish his authority in the other parts of Arabia, especially in the countries of Yemen, Tehama, Oman, and Bahrain. In reducing to obedience these refractory provinces, Abu Bekr was powerfully supported by Omar, afterwards his successor, and especially by Khaled ben Walid, a military commander of extraordinary courage and presence of mind. Besides this rebellion of some of its members, the Mohammedan state had to encounter other difficulties from several new pretenders to prophetship, who came forward in different parts of Arabia, and some of whom soon gathered numerous adherents around them. Among these the names of Osud al Abbasi, Tolaihah ben Khowaised, and Mosailamah deserve to be mentioned. Whatever disturbance these new pretenders might cause among the faithful Moslems, the firmness of their belief in the mission of Mohammed could not be shaken, since he himself had prepared them for the appearance of such impostors. Mosailamah seems to have been the most formidable of these enemies of the Islam. He was however defeated by Khaled, and killed in a battle near Akrabah. This conflict is memorable also on another account. The precepts promulgated at different times by Mohammed had, till then, never been collected in a volume; they were handed about in fragments written on palm-leaves or pieces of parchment, and in a great measure preserved by oral tradition. Many of the personal associates of Mohammed, who were from memory familiar with his doctrine, fell in the war with Mosailamah; and Abu Bekr, in order to obviate any future uncertainty about the genuine text of the ordinances, caused all the fragments to be collected, the passages remembered by heart to be written out, and the whole to be embodied in the volume known under the title of the Koran—a work which, from the importance of its contents, as well as the force and purity of its language, is the sacred and classical book of the Mohammedans.

When the authority of the caliphat was fully established in Arabia, Abu Bekr was anxious to increase the Mohammedan dominions by foreign conquest. Khaled was dispatched into Irak, and subdued several of the frontier provinces along the Euphrates, which belonged to the then declining empire of Persia; while two other commanders, Yezid ben Abi Sofyan and Abu Obeidah, with an army gathered from all parts of Arabia, entered Syria and defeated the troops of the Grecian emperor Heraclius. They also got possession of the town of Bostra, favoured, it is said, by the treason of its governor Romanus. But the siege and capture of Damascus by the united forces of Abu Obeidah and Khaled, which event was preceded by a decisive victory over a Greek army of 70,000 men near Ajnadain, forms the principal feature of this expedition, as it established the dominion of the Arabs over Syria, and in fact over the whole country between the Euphrates and the Mediterranean.

On the day of the capture of Damascus (23rd August, A.D. 634) Abu Bekr died, at the age of sixty-three years. Not one of his three sons, Abdallah, Abd-al-rahman, and Mohammed, survived him; and in his will he appointed Omar as his successor. Eastern writers praise the almost austere simplicity of his habits and manners, and his entire disregard of wealth, and the luxuries or even comforts of life. So determined was he not to be enriched by his elevation to the supreme command, that every Friday he distributed all the surplus of his income among such persons as he thought deserving of it. His short reign, of little more than two years, forms an eventful epoch in the history of Mohammedism; and Oriental authors have vied with one another in recording details about the early conquests of the armies of the Faithful. The volume of the great Arabic chronicle of Tabari, lately edited and translated by Kosegarten (Greifswald, 1831. 4to.), is entirely occupied with only the earlier part of Abu Bekr's reign; the latter part, or the history of the conquests of Irak and Syria, still remains unpublished. A highly interesting account of the siege and capture of Damascus, derived chiefly from the Arabic chronicle of Wakedi, may be found in Ockley's *History of the Saracens*.

ABULFARA'GIUS, properly MAR GREGORIUS ABULFARAJ, also called GREGORIUS BARHEBRÆUS, was an Oriental writer of much celebrity, who lived in the thirteenth century of our era. He was born in A.D. 1226, at Malatia or Melite, a town situated near the western bank of the Euphrates in Lesser Asia, where his father, Aaron, followed the profession of a physician. Though the offspring of a Jewish family, he embraced the Christian belief, to which he continued faithful till his death. It is, indeed, surmised that shortly before his death he renounced Christianity; but this unauthenticated report is sufficiently counterbalanced by the unqualified praise with which his name is mentioned by Christian writers, who would not have allowed such a fact to remain unnoticed. Abulfaraj studied theology, philosophy, and medicine. He spent the greater part of his life in Syria. At the early age of twenty years he was appointed Bishop of Guba, and subsequently of Aleppo. In 1266 he was elected Primate of all the Jacobite Christians in the East. He died at Meragha in Azerbijan, A.D. 1286.

Abulfaraj was the author of a great number of Arabic and Syriac works, but the composition through which his name has become best known among us is a universal history, originally written in Syriac, but subsequently translated by the author himself into Arabic, to which he has given the title of *History of the Dynasties*. It is divided into ten sections; the first of which gives some account of the patriarchs; the second of the Jewish commonwealth under the judges; and the third of the Jews under the kings; the fourth contains the history of the Chaldæans; the fifth of the Persians; the sixth of the Greeks; the seventh of the Romans; the eighth of the Christian Grecian empire; the ninth of the Mohammedan Arabs; and the tenth of the Mogols. In the early part of the work many errors are observable into which the author has fallen through his ignorance of the classical languages and literature. The section treating of the Mohammedan history is written with greater accuracy; and in his account of the Mogol dynasty, towards the conclusion of the work, Abulfaraj speaks from his own knowledge and experience as an eye-witness. Though written by a Christian, this work is held in high esteem even among Jews and Mohammedans in the East. To us its chief interest consists in the curious details which it contains concerning the history of science among the Arabs, particularly under the three Abbaside caliphs, Mansur, Harun al Rashid, and Mamun. An edition of the Arabic text of the *Dynasties*, accompanied with a Latin translation, was published by Edward Pococke, at Oxford, in 1663, 4to.; the Syriac text, likewise with a Latin version, was edited by Bruns and Kirsch, at Leipzig, in 1789, 4to.

ABUL FAZL, son of Sheikh Mobarik, was the vizir of the celebrated Mogol emperor Akbar, who reigned from A.D. 1555 to 1605. Of the history of his life few details are known to us. In 1602, when returning from an expedition to the Deckan, he was murdered in the district of Nurwar by banditti, and, it was suspected, by the contrivance of Akbar's son Selim, who afterwards succeeded his father on the throne, under the name of Jehangir. The extensive and valuable works, which, notwithstanding the duties of his high office, Abul Fazl found leisure to write, have ensured him a conspicuous place among the best authors, as well as among the most enlightened statesmen, of the East. His principal work is the *Akbar-Nameh*, which exists as yet only in MS., and contains a history of the reign of the sovereign whom he served, and to whom he was most devotedly attached; this history Abul Fazl carried down till very near the time of his own death, and it was afterwards continued by Sheikh Enaiet-ullah in a supplement, entitled *Takmileh-i-Akbar-Nameh*. But the work which has most contributed to make his name familiar to us, is the *Ayin-i-Akbari*, or *Institutes of Akbar*, a statistical and political description of the Mogol empire, and of the several branches of its administration, some account of which will be given hereafter. [See Ayin-i-Akbari.] Abul Fazl was a friend to the oppressed Hindus. It appears that the exertions which he made for their protection, and the zeal with which, assisted by his brother Feizi, he endeavoured to derive a precise notion of the nature of their political and religious institutions from their own ancient codes, prejudiced many narrow-minded Mohammedans against him. In his Persian prose translation of the great Sanskrit heroic poem, the *Mahabharata*, Abul Fazl has left us a curious and valuable monument of the persevering diligence which a Mohammedan statesman deemed it worth his while to bestow on the literature of the conquered nation, in the government of which he was called to assist by his counsels. Another of his works, less interesting to us, though much admired in the East on account of its refined and florid style, is the *Ayar-i-Danish*, or *Touchstone of Intellect*, a Persian translation from the Arabic of the well-known fables of Bidpaï, or Pilpay.

ABU'LFEDA, or, with his full name, Emad-eddin Abulfeda Ismaïl ben Ali, was the descendant of a collateral branch of the Ayubite dynasty, which Saladin, in A.D 1182, appointed to the sovereignty of the three towns Hamah, Maarrah, and Barin, in Syria, and which continued to hold that dignity even after the Bahrite Mamluks, under Azz-eddin Ibek, had, in A.D 1254, put an end to the Ayubite dominion over Syria and Egypt. Abulfeda was born in A.D. 1273, at Damascus, whither his family had fled before the Mogols, who then threatened Syria with an invasion, but were successfully repelled by the Bahrite Sultan Bibars. Mohammed ben Basel, once sent as ambassador to the German Emperor, Frederic II., is mentioned as having been one of his teachers. He began at an early age to display a warlike disposition, and to join in the expeditions against the remains of the Christian kingdom founded in Syria by the Crusaders. In 1285 he was present at the siege of Markab,—in 1289 at that of Tripoli,—and in 1291 at the taking of Akka (St. Jean d'Acre); at a later period (A. D. 1298), he accompanied his cousin Modhaffar, then the reigning prince of Hamah, on an expedition against the Mogols. After the death of Modhaffar, in 1299, the Bahrite Sultan Nasir declared the fief which the Ayubites held under him to have become extinct, and assigned a small pension for their maintenance. When, however, ten years afterwards, Sultan Nasir became personally acquainted with Abulfeda, he not only restored to him (1310) the former dignity of his family, but soon after, as an acknowledgment for his services, raised him to the rank of *malik*, or king. In 1316, Abulfeda was obliged to give up the town of Maarrah and its territory to the Arab Emir Mohammed ben Isa, who demanded this boon as a reward for his defection from the Mogols; but he retained Barin and Hamah, and, with his troops, often rendered military services to Sultan Nasir. Already in 1315 he had assisted him in an expedition against the town of Malatia or Melite, which had shown itself favourable to the cause of the European Christians, and to the Mogols. He continued on the most friendly terms with Nasir, till he died in 1331. The numerous works which he has left behind attest the extent and variety of his information. Among them we find mentioned works on medicine, Mohammedan jurisprudence, mathematics, and philosophy; those most commonly known are a treatise on geography, entitled *Takwim al-boldan*, or 'Disposition of the Countries,' and an historical work called *Mukhtasar fi akhbar al-bashar*, i. e., 'A Compendium of the History of Mankind. The geographical treatise consists of an introduction and twenty-eight sections on particular countries, each containing, first, a table, showing the latitudes and longitudes of the most remarkable places, and afterwards detailed statistical and topographical notices respecting them. Besides his native country, Abulfeda had seen Arabia, whither he went twice on a pilgrimage to Mecca, and also Egypt, which he visited frequently when he took the customary annual presents of homage to the court of the Sultan. In the description of such places as he had not seen himself, he takes care to name the authorities from whom he draws his information. A uniform edition and translation of the entire geographical work of Abulfeda is still a desideratum in oriental literature; the descriptions of single countries have been edited by Gravius, Reiske, Rommel, Kœhler, Michaelis, and others. The historical work is a chronicle after the usual comprehensive plan of Oriental works of this kind. It commences with a brief and very imperfect sketch of the ancient history of the Jews, Persians, Egyptians, Greeks, Romans, &c.; then gives some information about the history of the Arabs before the time of Mohammed, and thus passes over to its main object, the history of the Prophet, and of the Arabian empire, which it carries down as far as the year 1328. The earlier centuries of the Mohammedan power are but briefly treated, and many important events—for example, the conquest of Spain by the Arabs—are entirely passed over. Farther on the narrative becomes fuller and richer in interesting details. For the history of the Crusades it is one of the most important Oriental sources which we possess. The latter part of the work, or the history of Mohammedanism, was translated by Reiske, and edited with the Arabic text by Adler, at Copenhagen, in five vols. 4to. 1789-94; an edition and translation of the ante-Islamitic part has been published by Fleischer, Leipzig, 1831, 4to.

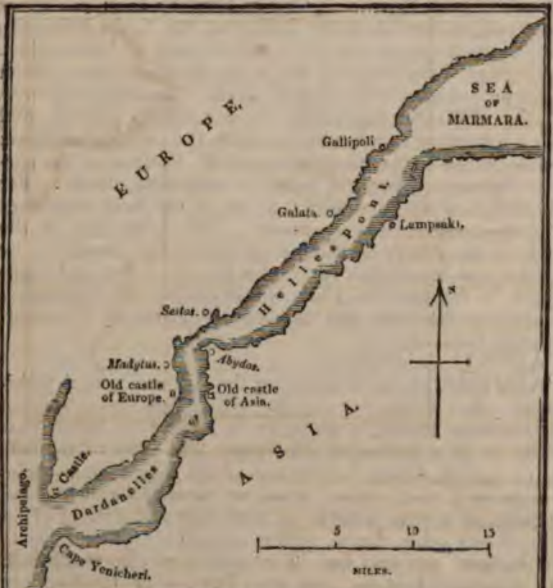
ABURY, see Avebury.

ABUTMENT, in building, or the practice of civil architecture, that which receives the end of, and gives support to, anything having a tendency to spread or thrust outwards, or in a horizontal direction. The piers or mounds on, or against, which an arch that is less than a semi-circle, or a series of such arches, rests, are abutments; while the supports of a semi circular or semi-elliptical arch, or of an arch of any other figure, which springs at right angles to the horizon, are imposts. The arches of the Southwark and Vauxhall bridges, over the Thames at London, are small segments of circles, even less than quadrants, and all their piers are abutments or abutment-piers; the arches of the London, Blackfriars, Waterloo, and Westminster bridges are all semi-ellipses, and their piers are imposts, or impost piers, and not abutments. Nevertheless, the piers at the extremities of a bridge, of whatever form its arch or arches may be, are always termed its abutments; that is, abutments of the bridge itself; for the road-way of most bridges forms the arc of a circle, and may be considered an outer arch, whose abutments are the land-piers. Level bridges, such as Waterloo-bridge, cannot, indeed, be said to have abutments, in the technical and more restricted sense of the term; but in its more general acceptation, as mounds or props which receive the ends of the series of arches of which the bridge is composed, and tend to prevent the possibility of their spreading, the land-piers of a level bridge also are abutments.—[See Buttress and Impost.]

ABUTTALS (from the French Abutter, to limit or bound) are the buttings and boundings of lands to the east, west, north, and south, showing by what other lands, highways, hedges, rivers, &c., such lands are in those several directions bounded.

The boundaries and abuttals of corporation and church lands, and of parishes, are usually preserved by an annual procession.

ABY'DOS, an ancient Greek town on the Asiatic shore of the Hellespont, now the Dardanelles, and nearly opposite Sestos on the European shore. It is said by Strabo to have been founded by the Milesians; but the date of its foundation, like that of many other Greek towns, is not accurately known. Abydos was burnt by Darius the Persian, after his Scythian expedition; and somewhat later (B.C. 480) the people of Abydos witnessed the immense army of Xerxes cross the stream on a bridge of boats.—(See *Outline of General History*, chap. viii.)—This bridge did not extend from Abydos to Sestos, which was a distance of more than three English miles, but it was formed at a narrower part, where the distance is somewhat less than one mile. It commenced on the Asiatic side, a little higher up the stream than Abydos; its termination, on the opposite coast, was at the projecting point opposite to Abydos, and between Madytus and Sestos. The practice of crossing large streams by means of boats lashed together, and covered with planks, was common among the Persians; nor were they used only for temporary occasions, but existed in the time of Herodotus and Xenophon over the great rivers of Western Asia, as they do now over the Tigris at Bagdad, the Euphrates, at Hillah near the ruins of Babylon, and elsewhere. When Darius, the father of Xerxes, crossed the channel of Constantinople, on his Scythian expedition, the bridge of boats was constructed by a Greek of Samos, who endeavoured to perpetuate his glory by causing a painting of the passage of the army to be put up in the great temple of Juno at Samos. A description of the bridge of Xerxes is given by Herodotus (vii. 36), who was on the spot probably much less than half a century after the event.



[The ancient names are in italics.]

The passage of Abydos has obtained a poetical celebrity from the story of Leander, who used to swim across the stormy waters of the Hellespont to visit his mistress Hero, whose name was commemorated even as late as the beginning of the Christian æra by a building called the Tower of Hero. There is extant a Greek poem by Musæus, who perhaps lived about the fourth century, descriptive of the love and tragical fate of Leander. In our own days Lord Byron has given a new interest to these localities by his poem of the *Bride of Abydos*.

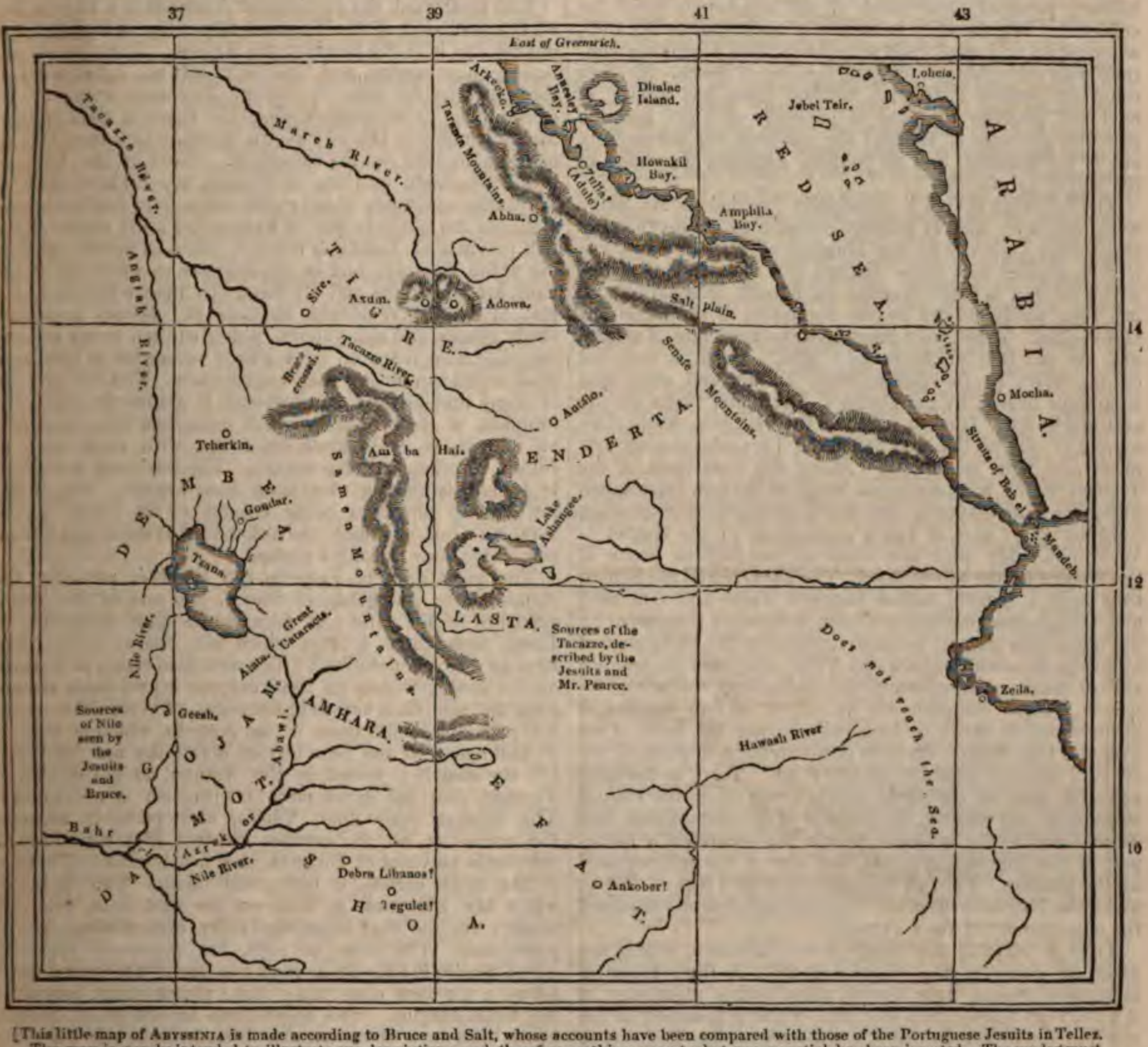
ABY'DOS, an ancient city of Upper Egypt, the remains of which are found near two villages, El Kherbeh and Harabat, about six miles from the west bank of the Nile (N. lat. 26° 12'). The chief building, which still remains, is nearly covered with sand, but the interior is in good preservation. Contrary to what we observe generally in Egyptian buildings, this edifice is constructed of both limestone and sandstone. In the interior it is said that constructed arches are found, similar to those of brick which Belzoni describes at Thebes. The numerous apartments in this building, and the style of decoration, show that Abydos was once a place of importance, and possibly a royal residence. When Strabo was in Egypt (about the commencement of the Christian æra) Abydos was a mere village, but he learned that the great building was called a Memnoneion, or palace of Memnon, and that tradition assigned to Abydos a rank in ancient time next to Thebes. 'There is,' says the geographer, 'a canal leading to the place from the river' but, besides this communication with the main stream, Abydos had the advantage of standing on the great canal which runs northwards, and is best known by the name of the Bahr Youssuf, though the *name* commences much farther north, at a place called Tarut es Sheriff.

In the year 1818, Mr. W. Bankes discovered on an interior wall of a building at Abydos, not belonging to the great edifice, a kind of tablet or genealogy of the early kings of Egypt, which is now generally called the Table of Abydos. Mr. Bankes made a copy of this, and others have been since made by Caillaud, Mr. Wilkinson, Burton, and others. The copy which we have before us is one by Mr. Burton, which is more complete and correct than that in Salt's Essay, which was made by Mr. W. Bankes. This tablet consists of three compartments lying horizontally one above another, and each compartment has been divided into twenty-six rectangles, so that the whole has once contained seventy-eight rectangles. No one compartment is perfectly entire, but enough remains of the lowest to enable us to determine the original dimensions of the whole table, and the number of compartments. Each of these rectangles contains an elliptical ring, or cartouche as it is sometimes called, such as may be seen on the Egyptain monuments in the British Museum; and each cartouche contains those various figures which are now generally admitted to indicate the names or titles of sovereigns. The lowest of the three compartments contains in the nineteen rectangles, which are complete, the title and name of Ramses the Great, perhaps the Greek Sesostris; the same prænomen or title, and name, having each probably been repeated thirteen times in the whole twenty-six rectangles, of which seven, as we have just stated, are erased. Deducting these twenty-six, we have remaining in the other two compartments fifty-two rectangles: the fifty-first and fifty-second contain the title and name of a Ramses, who may be a predecessor of Ramses the Great. The cartouches preceding these are probably the titles of kings; for example, the forty-seventh is the same as that on the great colossal statue at Thebes, and on the entire colossal statue in the British Museum, which is Amenophis II. (in Manethon's Catalogue), or the Greek Memnon. Whether the forty-six cartouches that precede this of Memnon belong to kings, his lineal predecessors, we cannot undertake to assert or deny.—[See article in the *Westminster Review*, No. xxviii. p. 405; vol. ii.]

ABYSSINIA. It is difficult to give, in a limited space, any very complete account of the country called Abyssinia, and this difficulty arises no less from the extent of the subject than from the want of sufficiently comprehensive and trustworthy documents. We shall endeavour, in this article, to give a brief description of the country, and to state the chief authorities for our present knowledge of Abyssinia, pointing out generally how far they are satisfactory.

The name of Abyssinia became known in Europe from the Portuguese missionaries who penetrated there. Tellez tells us that the name of the people is *Abexins*; but the Portuguese often write the names of the country and the people respectively in the Latinized forms of *Abassia* and *Abassinos*, from which our common term *Abyssinia* is derived. But as it frequently happens that we call a country by a name not used by the inhabitants themselves, so in this case we are informed by Ludolf that the word *Habesh* is Arabic, and signifies a mixed people, though the proof of the Abyssinians being a mixed people, as well as of their having originally emigrated from Arabia, has never yet been given. The name of Ityopayawan, or Ethiopians, is that which is adopted by the people when speaking of themselves, though we cannot say how far it is still in general use. They more commonly name themselves with reference to the great divisions to which they belong, such as people of Tigré, Amhara, &c.

The political boundaries of the country to which we give the name of Abyssinia have varied since the Portuguese first made us acquainted with it, as we may see from Tellez' *History of Ethiopia;* but to trace all these revolutions would not be a very easy or a profitable labour. The present political limits of Abyssinia will be given below. Though the term Abyssinia strictly belongs to a particular political division of Africa, it is often used in a vague sense as referring to an extensive country remarkable for the physical conformation of its surface. We shall endeavour to define what part of Africa may be conveniently comprehended under this term. Abyssinia is an alpine country, of high table-land, north of the equator, and containing the sources of two of the largest branches of the Nile, the Tacazzé, and the Bahr el Azrek or Abawi, besides the Mareb. Its nearest approach to the sea is in the Baharnegash territory, which forms the N.E. mountain-terrace of Abyssinia, and overlooks the flat coast near Arkeeko (N. lat. 15° 35′, E. lon. 39° 37′), on the Red Sea. The rulers of Abyssinia have at present no command of the sea-coast, Masowa and Arkeeko, &c. being in the hands of the Mohammedans. A series of terraces conducts from the west coast of the Red Sea to a high mountain range, which runs nearly parallel to the sea-coast for probably 300 miles, and forms a boundary between two different climates. Beyond this limit southwards we are not able to state its direction. Towards the north and north-west the mountain region of Abyssinia sinks down into the level countries of Sennaar and Kordofan: its greatest width from north to south it is at present impossible to state. By combining the maps of the Jesuits with Bruce's observations, it may be true that, following the meridian which runs through the great lake Dembea, this range may extend nearly 250 miles from the north limit bordering on the kollas, or low grounds of Tcherkin and Waldubba, to the almost unknown southern slope. On the south-east the terrace declines along the provinces of Shoa and Efat, which is indicated by the streams which water part of these provinces taking an east or a south-east course. We do not yet know whether or not the high land which divides the waters that feed the Bahr al Azrek from those that flow towards the Red Sea or the India Ocean, is continued westward or south-west towards the interior of Africa, though such a continuous range or high terrace seems exceedingly probable. The Bahr el Abiad itself, the main stream of the Nile, most probably has its rise in some lakes in a high table-land. This high table of land of Abyssinia is probably continued southward also. All we at present know about it is from the journey of Antonio Fernandez, which is briefly given in Tellez, but in such a way as to convey very little information. This zealous missionary left Dembea in March 1613, and crossed the Nile at the point where it turns to the north: he then went due south, and in the course of his journey crossed a large stream called the Maleg, and arrived at the kingdom of Narea, the north part of which lies in about 8° of north latitude. This country appears to be a kind of continuation of the high ground of Abyssinia, but as to its absolute elevation we know nothing at all.



[This little map of Abyssinia is made according to Bruce and Salt, whose accounts have been compared with those of the Portuguese Jesuits in Tellez. The map is merely intended to illustrate our description; and, therefore, nothing except what was essential has been inserted. The reader must infer the directions of many hills and mountains from the courses of the rivers, which, however, are very imperfectly known. Such places, as have not had their position determined with some degree of certainty, have a note of interrogation placed after them.]

The accounts of the Portuguese may still be considered as authority for many facts relating to Abyssinia, and the reader may see in the learned work of Job Ludolf how much information that industrious scholar was able to extract from them. Ludolf had also the advantage of personal acquaintance with Gregory, an Abyssinian then in Germany. Lewis Poncet, a French physician, who visited Gondar in 1699, to cure the king of some complaint, published an account of his journey. Finally, Mr. Bruce, in 1770, entered the country, and published an elaborate account of it sixteen years after his return. For reasons which we shall state more fully under the article BRUCE, we cannot here make so much use of that traveller as of Mr. Salt; and our notice of all those parts of Abyssinia which we know either entirely or principally from the travels of Bruce, must necessarily be very brief and imperfect. Though Bruce is often confirmed by the more recent traveller, we do not feel entire confidence in his accounts of those parts, which are known only from his own personal observation or the information which he collected. We therefore trust nearly altogether to Mr. Salt, whose plain and unadorned statements form a striking contrast with the rhodomontade and egotism of Bruce. Mr. Salt could not proceed to Gondar, because there was a kind of civil war between the Ras or governor of Tigré and the powerful governor of Gojam; the emperor was left entirely out of the question, and his political condition depended on the will of his viceroys.

The following sketch is principally founded on Mr. Salt's work, which we may at present consider as almost the only trustworthy authority for the kingdom of Tigré. Abyssinia is now divided into three distinct and independent states, which division is partly founded on natural boundaries, and has been partly caused by the incursions of the barbarous Galla tribes. These three great divisions are Tigré, Amhara, and the province of Shoa with Efat. Tigré is bounded on the north by the Bekla, Boja, Takué, and some wild Shangalla tribes; by the Danákil, Doba, and Galla on the east and south. It is separated on the west from Amhara by a great branch of the Nile called the Tacazzé, running first north and then north-west. Along the west bank of the Tacazzé is the bold mountain range of Samen (mentioned under the same name in the Adule inscription), extending from the south part of Lasta northwards to the district of Waldubha. Mr. Salt saw snow on the highest peaks of the Samen on the 8th of April. The Tacazzé and the Samen thus form a natural barrier between Tigré and Amhara; and though one province has been frequently conquered by the other, this natural boundary, joined to the difference of language between Amhara and Tigré, and other causes, has always made a real, effective, and permanent union impracticable. Tigré comprehends an extent of four degrees of latitude and as many in longitude, having the form of an irregular trapezium. Its most northern point is about 15° 35′ N. lat.; the most southern about 11° 20′. Tigré is the most powerful state of the three, which arises from the natural strength of the country, the courage of the inhabitants, and its proximity to the sea-coast, which has secured it a monopoly of the imported muskets, and also of the salt required for the interior. Though nominally held by a Ras or viceroy, under the Negus or emperor, it has not unfrequently assumed the appointment of the sovereign.

Tigré is properly the name of one province, which has given its name to the whole country. A high range of mountains passing near Adowa, about twelve miles east of Axum, runs through this province, which is bounded on the north by the Mareb (which is a tributary to the Tacazzé, or is lost in the desert), on the east by Agamé, on the west by Sire, and on the south by the Warré, which runs westward and joins the Tacazzé. This province contains ten chief subdivisions, and many others of little importance: 'its general character is that of a range of hill-forts, or "ambas," intersected by deep gullies and highly-cultivated plains.' The chief places are Adowa and Axum (see AXUM and ADOWA). East of Tigré is Agamé, which is rich and fertile, and on a level at a considerable elevation above the sea. A lofty mountain range forms its eastern frontier, which range, on the south-east, separates it from the great salt plain. The chief town is Genata. South of Agamé, Enderta comprises a great number of petty subdivisions, some of which form the eastern mountain boundaries of the great province of Tigré. The capital of Enderta is Antálo, N. lat. 13° 22′, E. long. nearly 40°, a position well adapted to protect the southern frontier against the Galla; on this account the Ras, or viceroy, has chosen it for his residence. Chelicut, near Antâlo, is the country residence of the Ras. South of Enderta, Wojjerat runs east and west: it contains extensive forests, which abound in elephants, lions, rhinoceroses, and all kinds of game. It is also famed for its white honey. The inhabitants, who are a fine race of men, are said to be descendants of Portuguese soldiers settled in the country. The small and low district of Wofila, bordering on Wojjerat, contains a fresh-water lake called Ashangee, the greatest length of which, according to Salt's map, is about twenty-six miles. The rugged province of Lasta (called Bugna by the early Portuguese writers), filled with almost inaccessible mountains, is the most southern part of Tigré. The language of Lasta is Amharic. North of it are two other small mountainous districts, Salowa and Bora; the low lands between which and the east bank of the Tacazzé are in the hands of Christian Agows.

Still northward, the province of Avergale is a narrow belt on the east bank of the Tacazzé, fifty miles in length; this district also is in the hands of the Agows. Their houses are built without mortar, and 'the better sort are constructed in the characteristic form of ancient Egyptian temples.' In confirmation of his remark about the forms of their houses, Mr. Salt refers to one of his own plates, which does not, in our opinion, bear out the statement. West of the Tacazzé is the mountain province of Samen, the highest land in Abyssinia, extending about eighty miles from north to south. Between the northern part of Samen and Tigré proper is the rich province of Temben; north of Temben is Sire, stretching to the Tacazzé; and on the opposite, or west side of the river, are Waldubha and Walkayt, which pay a tribute to the Ras of Tigré. Waldubha abounds in 'flowery meadows, shady groves, and rich valleys,' which contain many solitary devotees, who, however, have hardly succeeded in getting a good reputation among their countrymen. The last division of Tigré that we have to enumerate is commonly called the kingdom of Baharnegash, which comprises many districts, all now ruled by separate chieftains, with such titles as Shum, Kantiba, or Baharnegash. The last word, according to Ludolf, is nothing more than *Bahr-negash*, 'lord of the sea;' these provinces being nearest to the coast of the Arabian Gulf, on which the rulers of Abyssinia had once a power that they no longer possess.

The great river of Tigré is the Tacazzé, probably the Astasabas or Astagabas of Strabo, and one of the larger branches of the Nile. It rises in the high mountains of Lasta, from three sources which Mr. Pearce visited, and runs as we have described. The mountain range of Samen, on the west, prevents its receiving any considerable stream from that side, till it arrives in the region of Waldubha, where it is joined on its left bank by the Angrab, which is marked in Salt's map as the boundary of Waldubha and Walkayt. On the east it is joined by the Arequa, in the district of Temben, but the exact point of junction is not known. The Arequa rises near Antálo, and probably receives the waters of all the smaller streams that run through the fertile province of Enderta, as it has a wide bed which, in the rainy season, is often well filled. The Tacazzé, when Mr. Salt saw it, was, on the east side, low and sandy; but the west bank was rocky, and in some places precipitous. The river, he says, has numerous overfalls, which render it fordable at most seasons of the year; while between the fords deep holes occur, the favourite retreat of the hippopotamus. This amphibious animal, called *gomari* in the language of the country, is common in the Tacazzé; and Mr. Salt, with his companions, found, by experiment, that leaden balls from a musket seemed to make no impression on the hard heads of the monster. Crocodiles, called by the natives *agoos*, are of an enormous size in the Tacazzé, and more dreaded than the hippopotamus: those which Salt saw seemed to be of a greenish colour. The other great river of Tigré is the Mareb, which, rising in the mountains of Taranta, that form the north-eastern boundary of Tigré, flows north-west, and probably joins the Tacazzé in the kingdom of Sennaar: report says it is lost in the desert. Between Antâlo and the sources of the Tacazzé, Mr. Pearce only met with one small stream.

We shall now proceed to give a description of the mountain system of Abyssinia, which will be more intelligible after the kind of outline we have attempted. Abyssinia may be correctly called an Alpine land, and as it has never yet been well explored, our description of it must necessarily be very incomplete, and must depend altogether on the routes of the few travellers who have visited the country. The authorities are the accounts of the early Portuguese missionaries, Ludolf's *History of Ethiopia*, Poncet, Bruce, and the most important of all, Salt's and Valentia's travels. That part of the Alpine land of Abyssinia which lies between the Tacazzé and the Red Sea, and forms the kingdom of Tigré, being the best known, will have the most particular description.

Tigré has no sea-coast. The west side of the Arabian gulf, from about fifty miles above the straits of Bab-el-mandeb, as far as the bay of Massowa, is occupied by the Dancali, the Damhoeta, and Hazorta tribes. Arkeeko, on the bay of Massowa, is the only point of the Red Sea through which the people of Tigré can with any ease communicate with Asia; and it was one object of Salt's mission to ascertain what kind of commerce might be opened with Abyssinia in this direction. The Abyssinians, in the early centuries after the Christian era, carried on their commerce nearly as they do now; the only difference then was, that Zulla, the ancient Adule, about forty miles south-east of Arkeeko, was their sea-port in those days.

As the traveller advances from the dry sands of Arkeeko southwards, small elevations begin to appear on the second day, and on the fifth day he reaches the granite ridge of Tubbo, where the whole country assumes a different appearance, and instead of the mimosas that mark the region of sand and heat, the traveller's eye is greeted with hills, brooks, and forests, full of antelopes, monkeys, and elephants. Here the caper and tamarind trees, with their fruit, are seen; and tne fig sycamore. Two days more bring the traveller to the pass of the Taranta mountain range, where he must leave his camels, and make use of mules and oxen. The rocks at the foot of Taranta are described by Mr. Salt as a reddish species of granite; the ascent is at first gradual, though incumbered with fragments of rock, but afterwards it becomes so steep that riding is almost dangerous. The Abyssinian baggage-carriers cheer themselves by singing as they lightly mount the rugged paths. The vegetation changes with the ascent; and in one part where Salt observed, what he calls chalkstone, a hardy kind of cedar, called tud, was found in abundance. The descent from the summit of Taranta towards Dixan, which is the south-west side, occupies only a short time, and the traveller is now on one of the high terraces of Tigré. 'The view,' says Salt, 'that bursts upon the traveller, as he begins to descend the southern side of Taranta, is one of the most magnificent that human imagination can conceive, extending over the abrupt mountains of Tigré to the pinnacled and distant heights of Adowa.' On each side of this mountain range the seasons differ. On the south side, March 3rd, Salt found the heat intense, compared with what he had felt north of the Taranta, and the country dried up, while the cattle had all been driven across the mountains, in search of pasture. This region may be considered as the first terrace of Tigré, or that part of the kingdom called Baharnegash; it extends south from the Taranta pass about four days' journey, and north-westwards over the green meadows of Serawe, as far as the Mareb. The people here are dark-coloured, and speak the Geez language. Indian corn grows well in the country; large black sheep and white fine-haired cattle are abundant. Two roads lead from Baharnegash to Gondar, the capital; one which turns south and passes through Antálo; the other runs south-westward through Adowa, Axum, and Sire.

Mr. Bruce observed a phenomenon in passing the Taranta, which is not unusual in mountainous countries, only the violence of it in Tigré is perhaps something extraordinary. On the 17th November, the mountain tops were hid in clouds, and loud thunder was heard. 'The river scarcely ran at our passing it; when, all on a sudden, we heard a noise on the mountains above, louder than the loudest thunder. Our guides on this flew to their baggage, and removed it to the top of the green hill, which was no sooner done than we saw the river coming down in a stream about the height of a man, and the breadth of the whole bed it used to occupy.' An antelope was surprised by the torrent, and driven to Mr. Bruce's station. Mr. Pearce (Salt, p. 318) experienced a similar storm on the 27th of August, in his journey from Amphila Bay to Chelicut, before he reached the main ridge of the mountains. The 'gorf' or torrent came down so suddenly, that it swept away two camels which were in the bed of the river, and the people saved themselves with difficulty by climbing the rocks that bordered the stream. One camel was afterwards found alive jammed in between two rocks, and the other about a mile and a half lower down entangled in the boughs of a tree.

The plains on the top of Taranta are, in many places, sown with wheat, which Bruce found ready to cut in November. Mr. Salt, on his return from Adowa to Arkeeko by a new route, over that part of the Taranta which he calls Assauli, gives a beautiful picture of the highest parts of the mountain. 'The contrast which the scene before us now presented was very extraordinary; immediately in front lay a verdant plain, on which the natives were busily engaged, some in tending their cattle, and others in gathering in a field of wheat (May 22nd), while beyond an extensive prospect opened to the view over the burning regions of the Tehama, on which might be distinguished, at a distance, the mountain of Ras Giddam, the Island of Massowa, and the expanded line of the surrounding sea.'

The rest of Tigré may be in general described as a high table-land, consisting of different elevations, which we may consider as interrupted, or, in some cases, rather connected by mountain ranges. From the northern regions of Baharnegash we rise by various steps to the mountain province of Lasta, where the Tacazzé takes its rise, and which here forms the dividing line of the waters that run north-west to the Nile, and those which, taking a south-east course, enter the Indian Ocean, or are lost in the sand. The Samen, on the west of the Tacazzé, forms the high barrier in that direction; and though these mountains rise far above the bed of the river, the latter must have a very considerable elevation, which is indicated by the numerous falls by which its waters descend towards the province of Waldubha. Bruce crossed the Samen by the pass of Lamalmon, which, though very steep in parts, as he describes it, is of much inferior elevation to the southern eminences in the latitude of Antálo. The top is flat and cultivated. Mr. Bruce was fortunate enough to see all at once some people cutting down wheat, and others ploughing, while in the adjoining field there was green corn in the ear, and a little farther it was not an inch above the ground. The mercury stood at $20\frac{7}{8}$ inches, and no dew was experienced after first ascending the mountain, a phenomenon observable in some parts of the United States (in lat. 38°), at an elevation of a few hundred feet. No register of the thermometer being given (Bruce iv. 378), we can only guess the height of Lamalmon, where Bruce crossed it, to be about 9000 feet. In his tables, however, (vol. vii. p. 2,) he gives the height of the barometer on the top of this mountain at 19° 8′ 8″, the thermometer being 42° at night, by which we may estimate the highest point that he attained to be about 11,000 feet. Some of the more southern parts of the ridge are still higher.

Mr. Salt remarks, that in Tigré, properly so called, the soil is sandy, and the rocks rise in vertical strata over schistus and granite[*]. An extensive plain, which stretches westward to the Tacazzé from the hills of Haramat and Agamé, separates Tigré proper from the no less elevated districts of Giralta and Enderta, where the strata are nearer the horizontal direction, and the black mould in the valleys is well adapted for barley, On one of the routes from Adowa to Chelicut the traveller has to ascend on a higher terrace by the steep pass of Atbara, which brings him into Giralta.

The most remarkable characteristics of this country are the hill-forts, or Ambas, as they are called, which often rise with steep sides almost inaccessible, except by a few paths; on the top they sometimes display a level surface of considerable extent. Many of these minor elevations are formed of sandstone lying in horizontal masses, which have been split or worn down vertically, so as to give the whole a castellated appearance. Salt describes Devra Damo, north-east of Adowa, as completely scarped on every side, with one path leading up to it, and in this, as well as in its general appearance, resembling the hill-forts of India. The reader will form a better notion of the aspect of many parts of Abyssinia by looking at Salt's beautiful plates, than by any description. Plate xxi. contains a striking view of the mountains of Samayat, a strong natural post, with two high peaks and a plateau between them. Plate xxii. shows the vale of Calaat, a level plain covered with rich grass, which might pass very well for an English view, except for the precipitous rocks with which it is bounded.

That such a country as Abyssinia should contain prodigious cataracts, seems natural enough; and Mr. Bruce speaks of several that were near, or on his route from, Masuah to Gondar, though from his narrative we infer that he did not see them. The Mai-Lumi, a stream that falls into the Tacazzé, has, according to Bruce, a cascade 150 feet high. The Maisbinni, which joins the Tacazzé on the east side, 'falls in several cataracts near 100 feet high into a narrow valley, through which it makes its way into the Tacazzé.'

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[*] The obelisks of Axum are all of granite, probably brought from the neighbouring mountains.

We must briefly notice the other approaches to Tigré from the sea-coast. The most southern, leading from Belur, or Belal Bay (N. lat. 13° 14′), is only described by Father Lobo. It leads through Dancáli, and, after quitting the coast, runs along some elevations, till the traveller ascends through a mountain pass into a still higher and cooler region. This is followed by the great salt plain which borders the south-eastern frontier of Tigré, and is more particularly described by Mr. Coffin, who crossed it in 1809, on his route from Amphila Bay to Antálo. From the southern extremity of Amphila Bay (which Mr. Salt, with great probability, conjectures to be the Antiphilus of Strabo), after travelling nearly fifty miles somewhat south of west, Mr. Coffin came to the edge of the flat salt plain, which is said to run from south-east to north-west for four days' journey. The direction of this plain is stated, in Mr. Salt's work, as from north-east to south-west, which Ritter has copied; but this is at variance with Salt's map, and with the general direction of the coast and mountains. It took five hours to cross this plain; and the traveller was provided by the natives with sandals, made of the leaves of the dwarf palm, which are always used in crossing this desert. For about half a mile, the incrustation was slippery and broke under the tread, but afterwards Mr. Coffin found it hard, like a rough, irregular sheet of ice. On the west side he found the Abyssinians cutting out the salt in pieces like a mower's whetstone, which is done with tolerable ease, as it lies in horizontal flakes: the salt near the surface is pure and hard, but that beneath is coarser, and requires some exposure to the air before it is hardened. In some places the salt is three feet deep; but, in general, at the depth of two feet, it is too much mixed with the earth to be fit for use in its native state.

This district supplies all Abyssinia with salt. At the foot of the Senafé, which may be considered as a continuation of the Taranta mountains, a resident Shum, or chief, under the Ras of Tigré, collects, in kind, the tax laid on all salt that comes into the interior, except what is carried on men's backs. This salt, cut into long flat pieces, is one of the principal mediums of exchange in Abyssinia; its value, of course, increasing the farther it is carried westward. 'In the more remote parts of Ethiopia,' says Ludolf, 'you may buy a good mule with two or three bricks of that salt.'

Mr. Coffin, after crossing the Senafé, which is as high as the Taranta, found the seasons changed. He left behind him, on the coast, continued rain and tempests: here he found (16th January) a cloudless sky, and the people busily employed in getting in their harvest.

There is almost, but perhaps not quite, sufficient reason for believing that some part of the range of Samen, which is as high as any land in Tigré or Amhara, reaches the limit of perpetual snow, which, in this latitude, would give a height of about 13,000 feet. Mr. Pearce, on crossing the summit of Ambai-Hai, one of the highest points of the Samen, experienced a heavy fall of snow on the 17th of October; though on his visit to the sources of the Tacazzé, through the mountains of Lasta, on the 4th day of the same month, he does not mention any snow: but, on the other hand, he speaks of snow and ice lying in every hollow of the Amba-Hai, before he had attained the summit. The monument of Adule speaks of snow all the year round on the Samen; but this authority cannot be considered quite decisive. Mr. Salt's testimony to seeing snow on the Amba-Hai from the high land near Adowa (a distance certainly not less than fifty or sixty miles according to his own map), and on the 8th of May, is the strongest testimony that we yet have.

Of the kingdom of Amhara, which Mr. Salt did not visit, our information is neither extensive nor altogether exact. The authorities are the accounts of the Portuguese Jesuits, Poncet, and Mr. Bruce. Amhara is properly the name of one of the southern provinces, which has long been nearly altogether in the hands of the Galla, who have, however, generally adopted the manners of the Abyssinians. Near the centre of the country lies the lake of Dembea, the longest line on which according to Mr. Bruce's map, is about sixty-five English miles; but, as it receives the waters of an immense number of streams, the area of its surface varies considerably between the wet and the dry seasons. Around *this lake*, beginning with the province Begemder, bordering on Lasta, we find—Begemder, Menna, Belessen, Foggora, Dembea, containing the capital Gondar, Tcherkin, Tchelga, Kuara, Maitsha, Gojam, and Damot.

The kingdom of Amhara forms a high table-land, sloping towards Sennaar in the north, towards the Bahr el Abiad on the west, and having on the south-east, in the province of Amhara proper, high mountains connected with those of Lasta. Though we know many names of provinces, subdivisions of provinces, and tribes, our information about the country is exceedingly limited. The parts best known are those near the sources of the Nile, or rather of that branch of the river called the Bahr el Azrek, or Blue River, and the great lake Dembea. According to Bruce's barometer measurements, the height of the sources of the Azrek, which are at some elevation above the level of the lake, must be more than 10,000 feet; but, though this may be much above the truth, there is no doubt that the whole region round the Dembea Lake is a high plateau, in parts intersected by hills. The first account of the springs of the Nile is by Father Peter Paez, from whose unpublished MS. Kircher's account is taken, and this agrees with the account of Gregory, the Abyssinian, which Ludolf had directly from him (A.D. 1657). Paez visited them in 1618. Mr. Bruce visited them in 1770, and puts them in N. lat. 10° 59′ 25″, and E. long. 36° 55′ 30″; giving at the same time a much more minute account of them than that in Kircher, which is not very clear. According to Gregory, the spring-head first shows itself in a certain land, called Secut, on the top of Dengla, which we presume to be an eminence. After a north and north-eastern course of about seventy miles, it enters the lake of Dembea on the west side, having made two cascades of no great height. This lake may possibly be the Pseboa of Strabo. According to Bruce's map, and his journal of the route, this lake receives the waters of a prodigious number of petty streams. There are, according to Ludolf, eleven islands in it: the largest is called Tzana, whence the lake itself sometimes is called *Bahr-Tzana*, or the Sea of Tzana. All these islands, when Ludolf wrote, were possessed by monks.

The hippopotamus is abundant in this lake, but it seems doubtful if the crocodile inhabits it. The Nile, at its exit from the south-east side of the lake, runs south-eastward between Gojam and Begemder, after forming a large cascade at Alata: it then sweeps due south, compassing the land of Gojam with Damot, and leaving Amhara on its left. According to the map, its curve twice intersects the tenth degree of north latitude, and after the second intersection it proceeds in a course about west north-west. The Abyssinian name for the stream is Abawi, which some interpret *Parent*, as if it were the same as the Arabic word *Abou*, father; but this is, at least, doubtful, and those who are disposed to look for Sanskrit roots in the language of this country might connect *Abawi* with the Sanskrit, *Ap*, water. These regions round the lake, situated at so great an elevation above the sea, often enjoy a mild and pleasant climate, which the Portuguese found very like the best temperature of their own country. The seasons are three: the rainy season, from May to the beginning of September, which is that of rest; the summer, or season for the fruits of the earth; and the hot, dry season, which precedes the annual rains. Gondar, the residence of the Negus or Emperor, is north of the Dembea Lake, in N. lat. 12° 35′, E. lon. 37° 33′, and owes much of its present importance to the edifices erected by the Portuguese, the churches and royal castles, which have formed a nucleus for subsequent buildings. Mr. Bruce mentions a bridge with three arches near Gondar, which must be the work of the Portuguese, and another with four arches a little south of the capital. All Amhara was governed by a Ras named Guxo, when Salt was in Tigré, while the king 'lived in almost total neglect with only a few attendants at Gondar.' The warlike viceroys of Tigré and Amhara have, in fact, almost usurped the little authority that remained to the titular kings.

The provinces of Shoa and Efat lie south of Tigré and Amhara: but between Efat and Tigré is the extensive territory of Angot, and probably numerous tribes of which we know nothing. Efat is between the ninth and eleventh degree of latitude, and, if the descriptions are correct, it is intersected by some high land, which forms the line of separation between the streams that join the Nile, and those which run into the Hawash, a river that flows towards Zeila. Two arms of the latter river are described as nearly encircling the country. The chief town is Ankober. Efat is one of the best provinces of Abyssinia, and famed for a good breed of horses. The inhabitants are dexterous horsemen, and good soldiers. Shoa joins Efat on the west, and is well watered by the tributaries of the Nile: it contains fine pastures, large towns, and numerous monasteries. Devra Libanos, or the monastery of Libanos, was once, and perhaps still is, well filled with monks. It also contains the town of Tegulet, once the Abyssinian capital, when these two states, as well as Amhara and Tigré, were included in the empire. Mr. Salt had reason to believe, from the information which he received, that in Efat and Shoa the Ethiopic literature might be found in a purer state, and also more traces of ancient customs might be discovered. These regions are, indeed, a tempting field to the spirit of geographical enterprise, and would probably be accessible, without much risk, by setting out from Zeila on the coast.

The animals of Abyssinia present many varieties, as we might expect in so extensive a country; but those that are peculiar to these regions are all that will require a short notice here. It is only in the lower regions and forests that the monkey and the elephant are found; the latter leaving strong marks of his visits by the damage done to the smaller trees. This animal, together with the rhinoceros, boar, and buffalo, is hunted in Abyssinia; and we have in Bruce's *Travels* (vol. vi. p. 230) a curious account of this African field sport. The elephant is not found on the high terraces of Tigré, which are, indeed, nearly altogether without wood, and consequently not adapted to the habits of this animal. The two-horned rhinoceros, which is supposed to be peculiar to Africa, and is found also at the Cape, is common in Abyssinia, and was known to the Romans in the time of Domitian, as we see from an epigram of Martial; it is also accurately described by Cosmas, a Greek Christian merchant of the sixth century, who had seen it in Ethiopia, both alive and also stuffed with chaff. Its name, as given by Cosmas, is the same as the name by which it is still known—*arwe harisi*. The large-horned ox, called by Salt the Galla ox, is now well known, from his description and drawings · the largest horn that he saw was nearly four feet long, and twenty-one inches in circumference at the base; but the animal itself, contrary to what had been rumoured about it, is smaller than others of the same genus. The savage hyæna (*felis crocuta*) haunts every part of Abyssinia in great numbers, and often makes its way into the towns, to which it is somewhat encouraged by certain superstitious notions of the natives, that prevent them killing it whenever they can. The camel is only used in the lowlands on the coast; and the giraffe is not distinctly mentioned by any traveller as having been seen by him on the terrace lands of Abyssinia, though Mr. Salt seems to say it is found there.—(Appendix, No. 4.)

Mr. Salt speaks of the zebra as being found in the southern provinces; but his notice of it appears too vague to enable us to assign its geographical limits. The buffalo, the lion, various species of leopards (one of which is black), several varieties of the dog kind, and antelopes, are mentioned in Salt's Appendix, to which we refer the reader. Mr. Salt also mentions an undescribed species of lemur, with a clear white skin, adorned with a single black oval spot on its back. These skins come from Damot and Gojam, and are an article of trade. The ostrich is not found within the limits of Abyssinia Proper, which is not a country adapted to this bird's habits. Mr. Salt mentions that there are many species of falcons in Abyssinia; that vultures are numerous; and that the Egyptian goose is sometimes met with. Game, such as red-legged partridges, Guinea fowls, quails, snipes, and doves, is common all through the country. In Mr. Salt's Appendix will be found a list of the rarer birds which he collected in Tigré.

Among the insects, the locust is the only one described by Salt, being that species which is said occasionally to commit those dreadful ravages in Abyssinia, briefly described by Ludolf. Bruce speaks of a black ant, nearly an inch long, which cut his carpets in shreds, and thus proved its relationship, in mischief at least, to the white ant of India.

It does not fall within our plan to give any account of the vegetable productions of Abyssinia; those which are most worthy of notice will be found in their proper places. As an object of picturesque beauty, the daroo tree (*ficus sycamórus*), as we see it represented in Salt's view of the Obelisk of Axum, and in other drawings, must add materially to the appearance of the country. The grape we believe to be indigenous in Abyssinia, and in some parts tolerable wine is made. The jessamine, both orange and white, and yellow like that of Virginia; and a honeysuckle, resembling that of England, are plentiful in some parts. The caper-tree, says Bruce, grows as tall as an elm, and with a white flower, and a fruit as large as an apricot. After crossing the Tacazzé in N. lat. 13° 42′, he speaks of lemons and citrons. growing wild in the woods, which he seems to consider as indigenous, and not introduced by the Portuguese. He adds, that a branch of the Tacazzé is called Mai-Lumi, which he interprets the 'river of limes or lemons;' which has, to us, rather an apocryphal appearance. Bruce saw many fine orange-trees near Gondar, but he says that the only 'benefit expected from them is the shade.' The lemon-trees on the Mai-Lumi were full of good fruit, but the natives made no use of it.

That the Abyssinians are, even in their present state, somewhat superior to most African nations, will appear from the following list of articles manufactured among them:—Small carpets, from Samen, of good quality; parchment, from Axum; and iron and brass articles: but the best specimens of brass chains are brought from the south, where they are said to be manufactured among the Galla. 'Hides,' says Mr. Bruce, 'are tanned to great perfection in Tigré.' The Abyssinian saddle, as described by Mr. Salt, and the whole accoutrements of their horses, are good. The horses themselves are generally strong, well made, and kept in good condition; and the men themselves are excellent horsemen. They use long stirrups.

Of the manners of the Abyssinians of Gondar we have an elaborate picture by Bruce, which we believe to be heightened with the usual colouring of that traveller. In his eleventh chapter he describes a feast of the higher classes, in which a cow or bull is brought to the door; the feet are tied; the skin is stripped off the hind quarters; and the flesh is cut from the buttocks in solid square pieces. 'The prodigious noise the animal makes,' adds Mr. Bruce, with the most comical gravity, 'is a signal for the company to sit down to table.' The licentious termination of the feast exceeds anything that we know of the most barbarous nations of the earth, and may at least be doubted until it is confirmed. As to the Abyssinians eating raw flesh occasionally, or even frequently, *that* does not appear to us to be by any means beyond the reach of probability; and, indeed, we find Mr. Pearce (see Salt, p. 295) corroborating the fact so far as this—that some brutal Lasta soldiers, on a marauding expedition, while driving a cow, cut two steaks from the rump, which they devoured raw, to satisfy their craving hunger. The animal was then driven on to the camp, and killed. But Mr. Pearce, who had been several years in Tigré, never heard of such feasts as Bruce describes. Mr. Salt, when he was in Abyssinia, met with a learned doctor from Gondar, who had known Bruce, and spoke favourably of him. The feast story, however, was more than he would admit, and he expressed great abhorrence at the thought of it. At the same time he allowed that the licentiousness of the higher orders was carried much further in the kingdom of Amhara than in Tigré. Yet Mr. Sait met with many young men at Chelicut, who came from Gondar, whose dress and manners created a very favourable impression; and he says, 'I have reason to believe that, in general, the people of Tigré are much ruder in their habits and fiercer in disposition than those of Amhara.' The prince Kasimai Yasous, who was at Chelicut on a visit from Gondar, had superior accomplishments to most of the young men in the country, and could both read and write the Geez with great facility.

The early Portuguese writers allow the people of Narea the first rank among the Abyssinians for good manners, while their account of the people of Tigré was unfavourable, and in accordance with that of Mr. Salt. Yet this traveller lived three weeks at Chelicut, saw the Ras daily, and was often invited to his evening repasts, without either seeing or hearing of any of the indecencies and grossness which Mr. Bruce describes: intoxication, however, is common at feasts. The Abyssinian is in general well made, and sometimes handsome, with features completely Roman. Those of Narea are described as not darker than the Southern Europeans, but the people of Abyssinia in general are nearly black. They must not, however, be confounded with the negro tribes, as they have neither the nose, lips, nor hair that characterize the people of Western Africa. It is true that some of those whom Bruce saw on the Taranta had curly heads and short hair; but this is done by art, 'each man having a wooden stick with which he lays hold of the lock, and twists it round a screw, till it curls in the form he desires.' Mr. Salt saw, on one occasion, the Ras's wife, who was the sister of the Emperor, and he describes 'her form as elegant, though small; her features were regular; and, having fine teeth and coal-black hair, she might, in any country, have been esteemed handsome.'

Though the Abyssinians form a nation with a physical character that distinguishes them from other nations, yet the country contains some people of a different stock, such as the Christian Agows, who live along the east bank of the Tacazzé from Lasta to the confines of Shiré. It is said they were once Nile worshippers, and were converted in the seventeenth century to the Christian religion. There are also Agows, who are still Nile worshippers, about the sources of the Nile, who supply Gondar with cattle, honey, butter, wheat, hides, and wax. Bruce describes more particularly those who live near the sources of the river at Geesh. The high-priest of the Nile was a venerable old man with a white beard, seventy years of age, and blessed with a family of eighty-four or eighty-five children. The Geesh people never wash themselves or their clothes in the water that comes from the three genuine sources of the Nile, but in other streams tributary to that sacred river. The Waito, who live on the east bank of the Great Lake, are described by Bruce as speaking a language radically different from all others in Abyssinia: they feed on the hippopotamus, and are filthy and ill-looking.

The mountains of Samen, according to Bruce, are nearly occupied by Jews, otherwise called Falajas (a word signifying strangers), in which he agrees with Tellez, who says, 'the Falaxas, or Jews, occupy the strongest and highest points of the Samen; they are warlike, and have done much damage to the neighbouring provinces.' Tellez adds, that they still possess the Hebrew Scriptures, and chant the Psalms in their Synagogues. The Shangalla negroes, we are informed by Bruce, are very numerous in Gondar, where they are slaves; they are also used as slaves in Tigré. A more particular account of them, as well as of the Galla, those troublesome enemies of the Abyssinians, will be found under their respective heads. The state of slavery in Abyssinia is an improved condition for the poor Shangalla, for they escape numerous evils incident to their wild state, and are well treated.

The Abyssinians even now are not without authors. Mr. Salt brought to England a manuscript, containing an account of the Ras's last campaign against the Galla, which the Ras himself made a present of to Mr. Salt. The history was written by a court scribe, in a style very complimentary to his master. The Ras had a jester at court, whose powers of mimicry, and even of regular acting, were of a very high order. A painter was also in his service; and Mr. Salt has given (p. 394) an outline of one of his subjects, representing a combat between some mounted Abyssinians and Galla, which conveys rather a favourable impression of this artist's skill. The Abyssinians are generally fond of pictures, with which they line the inside of their churches and decorate their chief apartments, when they can procure them.

In our present state of knowledge it is not possible to attempt any complete classification either of the peoples or languages included within the limits of Abyssinia. There is no doubt that the varieties of language are very numerous. The chief tongue is the Geez, sometimes called the Ethiopic, in which the Scriptures are written. The spoken language of Tigré is a dialect of the Geez, which, in the course of time, has undergone considerable changes. The Geez is said, by Ludolf, to approach most nearly to the Arabic; and as we are unable ourselves to form a judgment on this matter, we shall quote the words of this distinguished scholar—'It approaches nearest to the Arabic, of which it seems to be a kind of production, as being comprehended almost within the same grammatical rules, the same forms of conjugations, the same forms of plurals both entire and anomalous; so that whoever understands either that or the rest of the Oriental languages, may, with little labour, understand this our Ethiopic.' The Amharic, now the spoken language of a large part of the kingdom of Amhara, is said, by Ludolf, to differ considerably from the Ethiopic in construction and grammar, yet, he says, 'for above half the language, as far as I can judge, the words are common to both.' From the list of Amharic and Tigré words given in Salt's Appendix I., it appears that these two languages do differ considerably, and yet they agree in the numerals (as far as examples are given), nearly altogether, which is a strong proof of an original close relationship. The Amharic language, according to Bruce, is now very widely diffused. Its alphabet is the same as the Geez, with seven additional characters to represent the compound Amharic consonants the origin of this alphabet is not known, though Mr. Murray asserts it to be derived from the Greek. (See article ETHIOPIA.) In Bruce's work, vol. ii. p. 416, the reader may see an account of the MSS. which that traveller brought from Abyssinia. We have purposely refrained from attempting any sketch of Abyssinian history, as it would lead us far beyond all reasonable limits.

The reader may consult, for further information, *Salt's Abyssinia*, 4to. 1814 — *Valentia's Travels* — *Bruce's Travels*, 7 vols. 8vo.—*Ludolf's History of Ethiopia*, translated, London, 1682—*Tellez, Historia Geral de Ethiopia*, &c., Coimbra, 1660; a copy in the British Museum—*Ritter's Africa*.

ABYSSINIAN CHRISTIANS.—The discovery of a body of Christians in so remote a country excited, in no small degree, the attention of Europe in the fifteenth century, which has been again revived by Salt's last mission, in 1810. From the "Tareek Negushti," or, "Chronicle of the Abyssinian Kings," combined with the evidence of the ecclesiastical writers, we learn that Christianity was introduced into Abyssinia in the time of Constantine, by Frumentius, or Fremonatos, as the chronicles call him. Frumentius, after residing some years in the country, was raised by Athanasius the patriarch of Alexandria, to the dignity of bishop. He arrived in Abyssinia, perhaps about the year A.D. 330, and probably in the reign of the King Aizanas, whose name still exists on the inscription of Axum. It is, however, not certain to which king of the Abyssinian chronicles we ought to apply the names of Aizanas and his brothor Saizanas, both of which occur on the inscription, and also in a letter of the Emperor Constantine, addressed to them A.D. 356. When the Greek merchant Cosmas visited Abyssinia, A.D 525, it was completely a Christian country, and well provided both with ministers and churches. Of the Abyssinian churches, which probably belong to the earlier periods of their conversion, or at least are eight or nine hundred years old, there are still some remains. The most remarkable is Abuhasubha, hewn out of the solid rock, which at this place is soft and easily worked. The Portuguese, Alvariz, describes ten such churches as these, of which he has given a plan, and one of them is probably the same as that which Mr. Pearce visited at Jummada Mariam. (Salt, p. 302.) The great church at Axum is comparatively modern, though parts of it, such as the steps, clearly belong to a prior edifice. Mr. Salt describes the well-built remains of a church, or monastery near Yahee, which he assigns to the sixth century of the Christian era.

The monastic, and also the solitary life, spread into Abyssinia from the deserts of the Thebais, and when the Portuguese Jesuits entered the country they found it full of such devotees; many of them seemed, however, to be monks only as far as celibacy was concerned, for they cultivated the ground and lived in villages.

Though a king of Abyssinia, Zarah Jacob, in 1445, sent an ambassador to the council of Florence, very little was known of the country until the Portuguese entered it. We cannot undertake to explain exactly how the notion of an Asiatic Christian prince residing in India, under the name of Prester John, got abroad; those who are curious may consult Ludolf (book ii. c. 1.) and the first chapter of the second book of Tellez. However this may be, John II. of Portugal, anxious to follow up the Portuguese schemes of discovery, and to discover the true Prester John, sent Peter Covilham and Alfonso Payva to find him out wherever he was. These envoys are said to have gone as far as India, but without success, and Payva returned home. Covilham, however, happening to be in some port of the Red Sea, heard of a Christian prince of the Abessines, whom he forthwith concluded must be the object of his search, and accordingly this enterprising man succeeded in reaching (A.D. 1490) the court of the Negus, or King of Abyssinia, which was then in Shoa. This was the beginning of that connexion between the Abyssinians and the Portuguese, which continued for about one hundred and fourteen years; but during this long period the missionaries had one leading idea, which was to bring over the Abyssinians to the Catholic faith. Peter Paez, who entered the country in 1603, actually prevailed on the Emperor, his brother, and the nobles, publicly to declare their adhesion to the Church of Rome.

Though the Jesuits pursued their proselyting practice with such pertinacity, they did not neglect to study the country itself, and, accordingly, it is to them that we owe our first accounts of many parts of Abyssinia; and for some, they are yet the only authorities. A list of the principal works of the Portuguese on Abyssinia is given by Salt, and the reader will see, in the compilation of Ludolf, and the abridgment of Tellez, how much we are indebted to these zealous and often very able men.

With the Christian religion, the Abyssinians received the Holy Scriptures, which they now possess in the ancient Ethiopic version, made, according to Ludolf, from the Greek Septuagint, though nothing is known of the date of this version. As to the New Testament, (says Ludolf,) no entire copy has been yet brought to Europe. Mr. Bruce brought with him from Abyssinia a complete copy of the Scriptures in the Ethiopic language, and also a set of the Abyssinian Chronicles. The Abyssinians divide the Scriptures, which they have entire, differently from what we do, making four principal parts of the Old Testament, and mixing what we call the Canonical with the Apocryphal books. The New Testament is also divided into four parts, to which they add the Book of Revelations as a supplement. For other information respecting the Abyssinian liturgies, and the religious opinions of the Abyssinians, we refer to Ludolf, Book iii. chap. 4, 5. Ludolf denies the existence of the book of Enoch, because he had only seen a spurious copy. A knave who got possession of an Ethiopic book, wrote the name of Enoch upon it, and sold it to Peiresc for a considerable sum of money, and this was the book that Ludolf saw. Bruce brought home three copies of the book of Enoch; one of which he gave to the Bodleian Library at Oxford. This book was originally written in Greek, but the original is lost—all but one large fragment. In the epistle of Jude reference is made to the prophecies of Enoch; and Mr. Bruce says, 'the quotation is word for word the same in the second chapter of the book.' This, however, will not prove the genuineness of the prophecies of Enoch, as Mr. Bruce has very well argued. An English translation of the book of Enoch was published by Dr. Lawrence, Oxford, 1822, 8vo.

The High Priest (or sole bishop) of Abyssinia is called *Abuna*, which signifies Our Father; and as Frumentius, the first bishop, received his appointment from the Patriarch of Alexandria, this dignitary has, probably, always been a foreigner. When Mr. Salt was in Abyssinia (1810), the Patriarch of Alexandria had just sent a Greek as Abuna, or High Priest, who, unfortunately, died of an epidemic disorder soon after his arrival. His followers were going back to Alexandria to see if they could get a new one appointed. The King is the head of the Church. Polygamy, though not allowed by the ecclesiastical canon, is common enough in practice; and Mr. Salt mentions an instance of one gentleman who had five wives at once. The king, of course, marries as many as he pleases: the clergy, also, who are not monks, may marry, but only once. A second marriage renders them unworthy of their sacred office, according to the ancient canons. Circumcision, according to Bruce, is practised in Abyssinia.

It would appear, from what we know of the Abyssinian Church, that its priests, at present, are not well informed, nor are the people in general well acquainted with the principles of the Christian religion, though they may be Christians in name; yet some of their ceremonies are conducted with great decency, and very much resemble those of the Church of England. When Mr. Salt stood godfather to a boy who was baptized into the Christian faith, after naming the child—George, he was requested to say the Belief and Lord's Prayer, and 'to make much the same promises as those required by our own Church.' The head priest then crossed the boy on the forehead, after dipping his hand into the water, and pronounced, 'George, I baptize thee in the name of the Father, Son, and Holy Ghost.'

When Salt was at Chelicut, Lent was strictly observed for fifty-two days, and no flesh was eaten during this period, though fish and various dishes were always plentiful on the table: the people always fasted till sunset. A feast followed this severe and protracted fast, in which they all seemed anxious to make up for lost time, by over-eating and drinking.

The Sacrament is also administered in Abyssinia, in a very decorous manner; and red-wine made of a grape, which is common in some parts of the country, is used on the occasion. Formerly, (says Mr. Salt,) if a man married more than one wife, he was excluded from participating in this rite, but wealth and power have induced the Church to relax its severity in this respect. Marriage itself, in Tigré, appears a mere civil institution: the woman keeps her name, and the parties can separate whenever they agree to do so. In this case the woman has her dowry back, which is not forfeited unless she is manifestly guilty of adultery. The higher classes are subject to no rule, but what may be considered as imposed by the relatives of the male and female. The Abyssinians bury their dead immediately after washing and fumigating the body with incense: while the bearers are putting it in the ground, the priests recite a form of prayer. Other strange ceremonies that follow are described by Salt. —*Ludolf's History of Ethiopia.—Bruce*, vol. ii. p. 422.—*Salt's Abyssinia.*

ACA'CIA-TREE. See Robinia.

ACA'CIA, the name of a plant of the pea-tribe, mentioned by Dioscorides, as a useful astringent thorn, yielding a white transparent gum. The account given by this Greek author, meagre as it is, accords so well with the gum-arabic trees of modern Egypt, that we can scarcely doubt their identity. Accordingly it is to these, and to others closely related to them, that the classical name is still applied.

Among the moderns, the Acacia is a very extensive genus of trees or shrubby plants, inhabiting the tropical parts of both the Old and New World, and, in a very few instances only, extending into temperate latitudes; although over the whole of Australia, and its dependent islands, the species are spread in much abundance.

Some of the species produce catechu and gum-arabic; the bark of others yields a large quantity of tannin, which, in the form of an extract, is annually imported from Van Diemen's Land in considerable quantity; the species from which this substance is procured are chiefly *A. decurrens* and *mollissima*. As objects of ornament they are usually of striking beauty; and it may be doubted whether, in the whole vegetable kingdom, equally brilliant colouring, and elegant foliage, combined with a most graceful aspect, are united in the same individuals.

Botanists are acquainted with nearly 300 species. Of these we shall mention only a few of the most interesting.

Generic Character.

Flowers polygamous.

Calyx, with either four or five teeth.

Petals, either four or five; sometimes distinct from each other, sometimes adhering in a monopetalous corolla.

Stamens varying in number from 10 to 200.

Pod not separating into many joints; juiceless, two-valved.

The species are extremely variable in the structure of their leaves and flowers. Some of them have true leaves that are twice or thrice pinnate, with a multitude of minute, shining, or at least even, leaflets; others have, in a perfect state, no leaves properly so called, but, in their stead, the leaf-stalks enlarge, and assume the appearance, and no doubt also the functions, of true leaves: species of the latter description are known by their spurious leaves being expanded vertically, instead of horizontally as in leaves of the ordinary construction. By these very remarkable points of difference in structure the species may be conveniently separated into two great subdivisions.

§ 1. *Leaves pinnated in various degrees.* About 200 species known.

Acacia Catechu. The catechu acacia. (*Willd. Sp. pl.* iv. 1097. Mimosa catechu, *Linn.*) Spines growing in the place of the stipulæ; when young, straight, but afterwards becoming hooked. Leaves in ten divisions; leaflets in from forty to fifty couples, linear, downy; with one depressed gland at the base of the leaf-stalk, and from two to three between the upper divisions. Flowers arranged in cylindrical spikes, which grow two or three together.—A tree with a tolerably high and stout stem; found in mountainous places in the East Indies, especially in Bengal and Coromandel. It is most common in Canara and Bahar. Its pods are from two to three inches long, quite flat, and of a narrow, oval figure. Its unripe pods and wood yield, by decoction, one of the sorts of catechu, or terra-japonica, of the shops, a powerfully astringent substance, formerly thought to be a kind of earth. The other sort of catechu is obtained from a kind of palm. [See Areca.]

[Acacia Catechu.]

Acacia Arabica, the gum-arabic tree. (*Roxb. Coromand. Plants*, 149.) Spines growing in pairs. Branches and leaf-stalks downy. Leaves in from four to six divisions; leaflets in from ten to twenty couples oblong-linear, with a gland between the lowest, and often between the outermost divisions. Heads of flowers growing in threes upon stalks. Pod necklace-shaped.—An inhabitant of the East Indies, Arabia, and Abyssinia, where it forms a tree thirteen or fourteen feet high, of inelegant appearance; easily recognised by its long, curved pods, which are divided into a number of round compressed joints, by means of contractions between the seeds. This is one of the plants that yield the useful substance called gum-arabic, which is procured by wounding the bark; after which the sap runs out, and hardens in transparent lumps, of various figures, very similar to the concretions found upon the bark of the cherry-tree in this country. Gum-arabic is also produced abundantly by some of the species nearly related to this, such as *A. Nilotica*, or *vera*, found in Egypt; *A. Ehrenbergii*, a native of Dongola; *A. tortilis*, a common plant in the west of Nubia, Kordofan, and Arabia, especially upon Mount Sinai; and *A. Seyal*, an inhabitant of Upper Egypt, Nubia, and western Arabia. It is supposed that gum-arabic is collected indifferently from all these, and that the gums of Jidda and Bassorah, gum-thur, and East India gum, are only picked samples. Gum-Senegal is the produce of a distinct species, called *A. Senegal*, found in Arabia and the interior of Africa. From this tree are said, by some, to be procured the pods called *bablach*, in the continental drug-shops; by others, however, they are referred rather to *A. cineraria*, and some other species.

[Acacia Arabica.]

Acacia discolor, the purple-stemmed acacia. (*De Cand. Prodr.* ii. 468. Mimosa discolor, *Bot. Rep.*) Spines none. Leaves with about five pairs of pinnæ; leaflets glaucous, tinged with purple, in from nine to twelve couples, oblong, smooth, acute, pale beneath; leaf-stalks glandular at the lower end, and covered with down, like the branches. Heads of flowers in long racemes, proceeding from the axillæ of the leaves.—A middle-sized tree, found in the southern parts of New Holland and in Van Diemen's Land, where it, in common with many others of the same genus, is called *Wattle*. It appears better adapted than most other Australian species to support our winters; near London it succeeds perfectly well, all winter long, in the open air, if wrapped round with mats, and it is to be presumed that there is no obstacle to its being almost naturalized in Devonshire and Cornwall and the west of Ireland. It is readily known by its bluish stems and leaves, which are slightly stained with dull purple, and form a strong contrast with its long, erect bunches of yellow blossoms.

Acacia pubescens, downy acacia. (*Hort. Kew.* v. 467.) Spines none. Branches not angular, hairy. Leaves with from three to ten pairs of pinnæ; leaflets in from six to eighteen couples, linear, very narrow. Heads of flowers globose, stalked, arranged in long racemes.—A native of the east coast of New Holland. In this country it is one of the most beautiful of green-house plants; if allowed to grow freely in the border of a good conservatory, it attains the height of ten or twelve feet; and in January and February produces a vast abundance of yellow blossoms, which weigh down the slender graceful branches, and perfume the air with a weak but pleasant odour.

Acacia Julibrissin, silk-tassel acacia. (*Willd. Sp. pl.* iv 1065. Mimosa Julibrissin, *Scopoli.*) Spines none. Leaves with from eight to twelve pairs of pinnæ; leaflets in about thirty couples, half-oblong, acute, somewhat fringed, with a flattened roundish gland at the base of the leaf-stalk. Heads of flowers on stalks, arranged in a sort of corymbose panicle at the end of the shoots. Pods flat, membranous, smooth.—A native of Persia and of the Levant. Its specific name is Latinised from two Persian words—*gul*, a rose; and *ebruschim*, silk; by which it is known in the countries where it grows wild. There it becomes a small tree, remarkable for its light airy foliage, and for the great beauty of the clusters of lilac flowers, the long and slender stamens of which stream in the wind, and glitter in the sun, like a number of silken tassels artificially fastened to the boughs. This species is now commonly cultivated in the warmer parts of Europe. In England it is seen trained against walls, where it succeeds indifferently well, flowering only occasionally so far north as the latitude of London. Its great enemy in this climate seems to be, not our winters, but the want of an intensely hot summer to prevent exuberant growth, and to ripen the shoots so perfectly, as to enable them to resist frost.

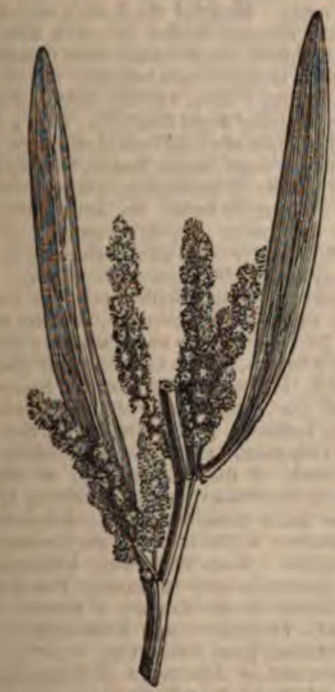
Acacia acanthocarpa, prickly-fruited acacia. (*Willd. Enum.* 1057.) Spines from the place of the stipulæ, growing in pairs, and hooked. Leaf-stalks without either prickles or glands; leaves in from six to eight principal divisions; leaflets in from six to fifteen couples, oblong, downy. Heads of flowers in pairs, stalked. Pods compressed, plane, falcate, with each margin prickly.—A native of New Spain, where it forms a small tree, with flesh-coloured flowers. It was some years since introduced to the gardens of France, in the southern provinces of which it proves hardy. In this country it is not so capable of resisting frost as *A. Julibrissin*, or some of the New Holland species, notwithstanding it is marked as hardy in some of our garden catalogues. As its flowers have little beauty, it is very seldom cultivated.

The *Black-wood* of Van Diemen's Land is the timber of *acacia melanoxylon;* and the astringent *jurema bark* of Brazil is the produce of *acacia jurema.*

§ 2. *Leaves pinnated in the young plant; in the old, consisting of nothing but the vertically distended leaf-stalks, called* PHYLLODIA. About 100 species.

Acacia decipiens, paradoxical acacia. (*Hort. Kew.* v. 465. Mimosa decipiens, *Bot. Magaz.* t. 1745. Adiantum truncatum, *Burm. Fl. Ind.* t. 66. f. 4.) Stipulæ spiny, deciduous. Phyllodia either triangular or trapezoidal; their midrib nearest the lowest side, and lengthened into a spine; a single glandular tooth on the upper edge. Flowers in nearly solitary compound heads.—This species is remarkable for the blunders to which it has given rise. When botany was only a science of names, its flowerless branches were taken for the leaves of a kind of fern; and, at a later period, when botanical geography was as yet unheard of, it was believed to be a native of the north-west coast of North America; an opinion as probable as that would now be considered which referred the origin of a race of blackamoors to Great Britain. It is an inhabitant of the south-west coast of New Holland, where it forms a bush of singular aspect. In this country it is cultivated in the green-house, and it flowers in March, April, and May.

Acacia Sophoræ, fragrant acacia, (*Hort. Kew.* v. 462; *Labill. Nov. Holl.* 2 t. 237.) Phyllodia narrow, tapering towards the base, quite entire, with one principal midrib; an oval gland on their upper edge near the stalk. Heads of flowers in dense slender racemes. Pods long, curved, taper-pointed, a little contracted between the seeds.—A native of the south side of New Holland and Van Diemen's Land. In this country it is a very ornamental green-house plant, which, if planted in the open border, will grow as high as eight feet. It flowers during all the early months of the year; producing its numerous clusters of sweet yellow blossoms in great profusion. Few plants are more worthy of a permanent station in a good conservatory.



[Fragrant Acacia.]

Acacia longifolia, long-leaved acacia, (*Willd. Sp. pl.* iv. 1050. Mimosa longifolia, *Bot. Reposit.*, t. 107.) Phyllodia of a narrow, lanceolate form, tapering to each end, with two or three strong veins at the base, and several in the upper part. Spikes of flowers axillary, growing in pairs, on short stalks.—Found very commonly on the eastern coast of New Holland, especially in the neighbourhood of Port Jackson, whence it was introduced into Great Britain, among the first of the natural productions of that remarkable country. It is not sufficiently hardy to bear the open air in this climate, except in the summer, and should be cultivated in the open border of a conservatory, if we wish to have it in perfection. So treated, it is a very elegant plant, growing twelve or fifteen feet high, and bearing large masses of fragrant yellow flowers, in the months of March, April, and May.

Cultivation. The species of this genus are increased artificially in two different ways. Most of them may be multiplied by cuttings struck in silver sand, placed under a bell-glass, and kept in a warm place, to which no direct solar light has access. Such of them, however, as do not increase with sufficient certainty by this method, *A. Julibrissin* for instance, have the power of producing shoots from pieces of their root placed in earth in a hot-bed; and by these the nurserymen generally propagate them. Their seeds, also, are very often received, and from these they can, of course, be multiplied in all cases.

ACADEMY. A house and garden in one of the suburbs of Athens, inclosed by a wall, and having the grounds laid out in walks shaded by trees, was the original Academy. It is commonly stated to have been so called from its original possessor Academus, or Ecademus, who is said to have established here a school of gymnastic exercises. Other etymologies of the term, however, have also been given. About the middle of the fifth century before the commencement of our era, the groves of Academus fell into the possession of Cimon, the Athenian general; and it was he who first adorned the place with statues and fountains, and added other improvements, so as to convert it into a retreat uniting to the charms of natural scenery many of the luxuries of art. At his death he left the garden to the public; and it became a favourite resort of the lovers of philosophy and solitary meditation. Hither Socrates was wont occasionally to repair to converse with his disciples. But it was his illustrious pupil, Plato, who first gave celebrity to the Academy as a seat of philosophy, by establishing here the school over which he presided for nearly half a century. Hence the Platonic philosophy is frequently called Academism, or the philosophy of the Academy; and its followers, Academics, or Academists. Plato died about the year 348 before the Christian era. About the year B. C. 296, one of his successors, Arcesilaus, introduced certain changes into the original doctrines of the school; and he is on this account considered the founder of a second, or Middle, as distinguished from the Old academy. There was also in this sense a third academy, called the New, of which the founder was Carneades, who flourished about a century after Arcesilaus. Some writers even reckon a fourth Platonic academy, founded soon after the time of Carneades, by Philo (not the celebrated Platonic Jew), and Charmidas or Charmadas; and a fifth, designated the Antiochian, from its founder Antiochus, who had been a disciple of Philo. The opinions of these different schools will be explained under the heads PLATO, ARCESILAUS, &c. With regard to the academy of Plato, we may further notice that it was situated in the suburb, lying to the north-west of Athens, called Ceramicus, that is, literally, the Place of Tiles; and it has been remarked, as a curious coincidence, that the principal public garden of that city should thus have apparently had the same origin with the *Tuileries* of the modern capital of France, a name which also indicates that the site was anciently that of a tile-work. Cicero had a country seat on the Neapolitan coast, to which, as one of his favourite retreats for philosophical study and converse, he gave, in memory of the famous Athenian school, the name of Academia. It was here he wrote his Academic Questions. Its remains are still pointed out near Pozzuoli, under the name of the Bagni de' Trìtoli.

After the restoration of letters in the fifteenth century, the term Academy was revived in Italy, but with a signification somewhat different from what it had borne in ancient times. It was used to imply, not a school in which philosophy was taught by a master to his pupils, but an association of individuals formed for the cultivation of learning or science, and usually constituted and endowed by the head of the state in which it was established. What was now called an academy, in fact more nearly resembled what was anciently denominated a Museum,—the name given, for example, to the famous association of the learned, founded by the first Ptolemy, at Alexandria, which so long subsisted in that city. The emperor Charlemagne is also recorded, towards the close of the eighth century, to have established in his palace at Paris a society of this description. It was the fancy of the members of this society to assume each a classical or scriptural appellation. At their meetings they were accustomed to give accounts of such books as they had been studying; and their attention is said to have been also directed, not without effect, to the regulation and improvement of the vernacular language of the country. This association, however, existed only for a few years; and it does not seem to have been imitated elsewhere. Charlemagne was also the founder of the University of Paris, and several other schools and seminaries of instruction; but although the Greek term Academia has often, at least in more recent times, been applied to such institutions, they are altogether distinct in their nature from what is properly called an academy, and they will, therefore, be more appropriately and conveniently considered under the terms *University*, *College*, *Gymnasium*, *School*, according to the names by which they have been severally distinguished, than under our present head. On this point it is only necessary further to remark, that, from the application just noticed of the Greek term, it has of late become common, more especially in England and the United States of America, to give the name of academies to those seminaries in which so many various branches of education are taught as to entitle them to rank, it may be thought, as a sort of minor universities. In this sense, many of the principal towns in Scotland have their academies, which are merely great schools, such as in Germany would be called gymnasia, embracing in some cases both the languages and the sciences, but in general confined chiefly to the latter. In England, again, the colleges of the dissenters are commonly called academies; and the name is also frequently assumed by mere private boarding-houses, on however small a scale. The government institution at Woolwich for the instruction of military cadets is called the Royal Military Academy. It was founded in 1741, and is under the direction of the Board of Ordnance. There is also a Royal Naval Academy at Portsmouth, founded in 1722, under the direction of the Board of Admiralty. The Jewish seminaries for the highest branches of learning, in the different countries of Europe, have usually borne the name of academies. The same name has long been applied to schools of riding, of dancing, and of gymnastic exercises.

On the other hand, many of those associations of the learned, which, in all material respects, resemble the academies that arose in Italy with the revival of letters, are, nevertheless, not known by that name. They are called not academies, but *societies*, *associations*, *museums*, *lycæums*, *athenæums*, *institutes*, &c. If these different bodies were generally connected as parts of a great whole, it might be desirable, notwithstanding this perplexing diversity of appellations, to review them all in the same article; but they are not, in fact, related either as ramifications from a common stem, or by any other principle uniting them into one community; and we shall therefore adopt the plan most convenient for the purposes of reference, of only noticing, under our present head, those of them that are designated academies, and distributing the rest under the other titles by which they happen to be distinguished.

I. ITALIAN ACADEMIES.—Italy, as we have said, was the first country in which literary and scientific academies were established on the modern form, and there they have always flourished in the greatest number. A writer of the name of Jarckius, who, in 1725, published at Leipzig an account of the Italian academies, enumerates nearly 600 as then existing. Scarcely a town is to be found without such an institution, and most of the principal cities have ten or twenty, or more. We shall notice a few of those that have been most celebrated. The first that deserves to be mentioned is the Platonic Academy, established at Florence about 1474, by Lorenzo de' Medici. Its principal object was the study of the works of Plato, to which were afterwards joined the improvement of the Italian tongue, and the perusal and explanation of the poetry of Dante. Marsilius Ficinus, Picus Mirandola, Machiavel, Angelo Politian, and other persons remarkable for learning and genius, were among the early members of this association. The civil troubles of Florence occasioned the dispersion of its members in 1521. In 1560 was established at Naples, the first association for the cultivation of physical science, and the origin and model of many others in different countries of Europe, under the name of the Academia Secretorum Naturæ. It was, however, soon after abolished by the ecclesiastical authorities. To it succeeded the Academia dei Lyncei, founded at Rome, in 1609, by Prince Cesi, of which Galileo was a member. Prince Cesi died in 1632, and soon after the Academy was dissolved. Another of the same name was established at Rome in 1784, which still exists. But the most celebrated of the Italian academies is that named the Academy *della Crusca*, that is, literally, *of the Bran*, or *Chaff*, in allusion to the object of its institution, the purifying of the national tongue, and the sifting, as it were, of its flour from the bran. It was established at Florence in 1582, principally by the exertions of the poet Antonio Francesco Grazzini, who is much celebrated for the purity of his style. The Dictionary of the Academy *della Crusca*, first published under the title of *Vocabolario degli Academici della Crusca*, at Venice, in 1 vol. folio, in 1612; but augmented, in the last edition (Florence, 1729—1738), to 6 vols. folio, is considered as the standard authority for the Italian language; and the writers from whose works it has been collected, or whom it recognizes as classics, such as Boccaccio, Machiavel, &c., are hence frequently denominated *Autori Cruscanti*. The Academy *della Crusca* is now incorporated with two still older societies, the Academia degli Apatici, (or Academy of the Impartials,) and the Academia Fiorentina, originally the Academia degli Umidi, founded in 1549 by Cosmo I. The united institutions bear the name of the Royal Florentine Academy. Another very famous old Florentine academy is that entitled *Del Cimento*, that is, the *Academy of Experiment*. It was instituted for the cultivation of physical science, by the Cardinal Leopold de' Medici, brother of the Grand Duke Ferdinand II., in 1657. Among its first members were Borelli, Viviani, &c. A collection of experiments on the pressure of the air, the compressibility of water, on heat, sound, projectiles, light, and other subjects belonging to natural philosophy, was published in Italian by the Academy del Cimento in 1667, of which Muschenbroeck afterwards gave to the world a Latin translation, with valuable notes. Many of the Italian academies are remarkable for the fantastic names by which they are designated. Of this, indeed, the Academy della Crusca is itself an example. And it seems to have borrowed the idea of its title, and also of its device, a sieve, with the motto, '*Il più bel fior ne coglie*,' (It collects the finest flour of it,) from a previous society, established, soon after the revival of letters, at Perugia, called the Academy degli Scossi, that is, the Academy of the Well-shaken; by way of intimating, it is said, that the mind requires to be thoroughly tossed up, and shaken free of its refuse, before its powers can be properly exerted. The emblem of this society was also a sieve, with the Latin motto, *Excussa nitescit* (Shaken out it shines). There was another academy at Perugia, with which this became eventually united, called Degli Insensati, that of the Fools or Simpletons. In various other towns are or were the Academies of the Anxious, of the Confused, of the Impatient, of the Unstable, of the Drowsy, of the Sleepers, of the Awakened, of the Undeceived, of the Agitated, of the Humid, of the Inflamed, of the Insipid, of the Audacious, of the Dead (*Trapassati*), of the Fantastic, of the Nocturnal, of the Dissonant, of the Fluctuating, of the Thundry (*Fulminales*), of the Smoky, of the Ramblers (*Vagabondi*), &c. &c. The Latin name of the Academy della Crusca, we ought to observe, is the *Academia Furfuratorum*, that is, of the bran-sifters. Some interesting information on the early Italian Academies may be found in the 9th chapter of the Life of Galileo, in the *Library of Useful Knowledge*; and in Morhof's *Polyhistor*, and Tiraboschi's *Storia della Letteratura Italiana*, there referred to.

Among the existing Academies of Italy that have not been mentioned above, the following are some of the principal: the Royal Academy of Sciences and Belles Lettres of Naples, founded in 1779: it has published its Transactions, which contain many valuable papers on mathematical subjects, since 1788. The Herculanean Academy of Naples, founded in 1755: the first volume of its Transactions appeared in 1775, under the title of *Antichità di Ercolano*, and it has been followed by several others. The Academy of Etruscan Antiquities at Cortona founded in 1726, and that at Florence founded in 1807, both of which have published valuable Transactions. There are also academies at Padua, Milan, Siena, Verona, and Genoa, by all of which some volumes of Transactions have been printed. The Academy of Bologna was originally founded in 1690, by the afterwards distinguished astronomer Eustachio Manfredi, then only sixteen. The associates called their institution the Academia degli Inquieti, and took for their motto the words *Mens agitat*. In 1714 this academy was united to the University or Institute of Bologna, since which event it has been called the Academy of the Institute, or the Clementine Academy (from Clement XI., the then Pope.) Its Transactions have been published under the title of *Commentarii*, since 1731. To this list we may add the Royal Academy of Turin, in Piedmont, which was originally a private association founded about the middle of the last century, by the young Lagrange, then, although not yet twenty years of age, holding the office of Professor of Mathematics in the Royal Artillery School of that city. The first volume of its Transactions was published, in Latin, in 1759, and surprised the scientific world by some papers of great originality, to which the name of Lagrange was appended. The Turin Transactions, which continued for some years to be enriched by the contributions of this eminent mathematician, were published, in Latin, till 1784, since which time they have appeared in French.

II. French Academies.—We shall not here notice the ancient society established, it is said, about the middle of the twelfth century, at Toulouse, for the cultivation of poetry, or, as it was then called, the Gay Science, although it has been sometimes designated an academy. An account of that, and of other institutions of a similar description, will be more fitly given under the head Troubadours. The earliest of the French Academies, properly so called, is of much more recent date. The Académie Française was instituted in 1635 by Cardinal Richelieu, for an object of the same nature with that proposed by the Academy della Crusca,—the purification, regulation, and general improvement of the national tongue. This society, in imitation of its Italian model, published in 1694 the first edition of a French Dictionary, known by the name of the Dictionary of the Academy, to which it afterwards made many additions in successive reprints. This work, however, has scarcely perhaps attained the same authority with that of the Della Cruscan academicians; partly owing, no doubt, to the comparative immaturity of the French language when it was thus attempted to restrain its further growth. The original number of the members of the Académie Française was forty, from whom were elected a director and a chancellor every three months, as well as a secretary, who held his office for life. It used to meet three times a week in a hall appropriated to its use in the Louvre. This constitution it continued to retain till the year 1793, when it was abolished, with most of the other establishments which had subsisted under the ancient government. Two years after it was restored as part of the Institute, of which we shall presently give an account. The next of the French academies, in point of antiquity, is the *Académie Royale des Inscriptions et Belles Lettres.* It was established in 1663, in the reign of Louis XIV., by Colbert, and consisted originally of a few members selected from the Académie Française, who used to meet weekly in the library of that minister, and to employ themselves in inventing designs for medals to be struck in commemoration of the royal victories, examining the paintings and sculptures proposed for the embellishment of Versailles, and discussing the manner in which the gardens of that palace should be laid out and the apartments decorated. They were called, and not inappropriately, if a reference was intended to their occupations as well as to their numbers, *La Petite* Académie, the little academy. Their place of meeting was afterwards changed to the same room in the Louvre in which the Académie Française assembled, and they then began to hold two sittings in the week. In 1701 this academy was placed, by an edict of the king, upon a new and more extended foundation; and from this date it published every year a volume of memoirs, many of great value, till it was suppressed at the Revolution. It consisted, at the period of its suppression, of ten honorary members, ten pensionaries, and twenty associates, exclusive of several corresponding members. The Académie Royale des Sciences was originally established by Colbert in 1666, but was entirely remodelled in 1699. By the new constitution its researches were confined to the department of the physical sciences. The Académie des Sciences first began to publish its Transactions in 1666, and from 1699 a volume appeared regularly every year till the academy was suppressed in 1793. These three academies, together with the Académie Royale de Peinture et de Sculpture, which had been rather a school of painting than an association of cultivators of the art, were restored by the Directory in 1795, and united into what was called the National Institute. A new organization was given to this establishment by Bonaparte in 1802; and it was finally remodelled in the form in which it still exists soon after the second restoration of the Bourbons in 1816. As now constituted, the Institute, or Académie Royale, consists of five divisions; the first called the Académie des Sciences, composed of sixty-five ordinary and one hundred corresponding members; the second called the Académie Française, composed of forty members; the third called the Académie des Inscriptions et Belles Lettres, composed of forty ordinary and sixty corresponding members, together with eight associates; the fourth, called the Académie des Beaux Arts, composed of forty-one ordinary and thirty-six corresponding members, with eight associates; and the fifth, which has been only lately added, called the Académie des Sciences Morales et Politiques, composed of thirty members. Each class meets by itself once a week. Vacancies are filled up by the votes of the members, subject to the approval of the king; and each of the regular members receives a salary of 1500 francs per annum. The meetings of all the classes are held in the hall which was formerly the Chapel of the College of the Four Nations, now called the Palais des Beaux Arts. The French Institute has, since its establishment, ranked as the very first of the scientific associations of Europe, the most illustrious of whose philosophers have usually been comprehended in the list of its members.

There is also in Paris the Académie Celtique, founded in 1807, and now called the Société des Antiquaires de France, which has published several volumes of interesting and important *Mémoires.* There are likewise academies in many of the provincial capitals of France; among which the chief are those of Soissons (1675), of Nismes (1682), of Angers (1685), of Lyons (1700), of Bordeaux (1703), of Caen (1705), of Montpellier (1706), of Béziers (1723), of Marseilles (1726), of Rochelle (1732), of Dijon (1736), of Toulouse (1740), of Rouen (1744), of Montauban (1744), of Amiens (1750), of Besançon (1752), of Châlons sur Marne (1753). Many of these institutions have attained considerable celebrity, and some of them have published their Transactions.

III. Spanish Academies.—A society for the cultivation of physical science, under the title of Academia Naturæ Curiosorum, was established at Madrid, in 1652, on the model of the old Academia Secretorum Naturæ, already mentioned as having been founded at Naples in the middle of the preceding century. Of the existing Spanish academies the most important are the following:—The Royal Academy of Spain, founded at Madrid, in 1714, principally by the exertions of the Duke of Escalona. It is constituted on the model of the Academia della Crusca and the Académie Française, and has for its object the improvement and purification of the Spanish language, of which it has published a Dictionary, under the title of *Diccionario de la Lengua Castellana,* six vols. fol., 1726-1739. The Royal Academy of Spanish History: this commenced as a private association at Madrid in 1730, but was taken under the royal protection, and incorporated by Philip V. in 1738. It consists of twenty-four members. The first volume of its Transactions was published in 1796, under the title of Memorias de la Real Academia de la Historia. It has also printed some ancient manuscripts, and given new editions of some historical works; and it has long been engaged in preparing a Geographical Dictionary of Spain. There are also an Academy of History and Geography at Valladolid, and a Literary Academy at Seville, both founded in 1753.

IV. Portuguese Academies.—An Academy of Portuguese History was established at Lisbon, in 1720, by King John V., consisting of a director, four censors, a secretary, and fifty members. But the principal Portuguese academy is the Academy of Science, Agriculture, Arts, Commerce, and general Economy, founded by Queen Maria in 1779. This institution consists of twenty-four *socios veteranos,* or acting members, and thirty-six honorary and foreign associates. It is liberally endowed by the government, and possesses a library, a museum, an observatory, and a printing-press. The members are divided into three classes—1. that of natural science; 2. that of mathematics; and 3. that of Portuguese literature. It has published several volumes of Transactions in different sets; that entitled De Agricultura, commencing in 1787; de Economica, in 1789; de Letteratura Portuguesa, in 1792; and das Sciencias, in 1797. There is also a Geographical Academy at Lisbon, established in 1799, which has published a map of Portugal.

V. Austrian Academies.—Of these the most ancient is the Academia Naturæ Curiosorum, established at Vienna in 1652. In 1687, during the reign of the Emperor Leopold I., it assumed the name of the Academia Cæsareo-Leopoldina. Its Transactions were at first published in separate treatises, but since 1684 they have appeared in volumes, under the title of Ephemerides et Acta Academiæ Cæsareæ Naturæ Curiosorum. A history of this academy was published by Büchner, at Halle, in 1756. The Academy of Arts and Sciences of Vienna was founded in 1705. In 1754 was established in the same city an Academy for the cultivation of the Oriental Languages; and in 1783 a Surgical Academy, which distributes every year three prize medals of the value of fifty guilders each.

VI. Prussian Academies.—The Royal Academy of Science and Belles Lettres of Berlin has long been one of the most eminent among the learned societies of Europe. It was established in 1700, by Frederick I., who appointed the celebrated Leibnitz its first president. The first volume of its Transactions appeared in 1710, under the title of *Miscellanea Berolinensia*, and other volumes followed at intervals of three or four years, till the accession of Frederick the Great in 1740, who, in 1744, took it under his special protection, and proceeded to give it a new organization, with the view of extending its usefulness, and raising it to a higher rank than it had hitherto enjoyed. Maupertuis was appointed its president, and the academy was divided into four classes:—1. The physical class, for natural science; 2. the mathematical class, including astronomy; 3. the philosophical class; 4. the historical and philological class. Each class chooses its own director, who continues in office for life. Vacancies are also filled up by the votes of the members, subject to the approval of the king. Since 1746, a volume of the Transactions has appeared regularly every year. They used to be in French; but are now published in German. The old Memoirs extend to the year 1771; after which date they are called the *Nouveaux Mémoires*, down to 1787; with which year a third series commenced. A history of this academy was published in 1752. In 1798, the Royal Library and Cabinet of Arts were united with, and placed under the superintendence of, the academy; they are now separated. In 1754, was established by the Elector of Mentz, the Electoral Academy at Erfurt, for the promotion of the useful sciences. Its Transactions were originally published in Latin, under the title of *Acta Academiæ Electoralis Moguntinæ Scientiarum Utilium*; but they have of late appeared in German.

VII. OTHER GERMAN ACADEMIES.—Of these, the principal are—the Academy of Sciences, otherwise called the Royal Society, of Göttingen, established in 1733; the Electoral Academy of Science and Bavarian History at Munich, first established in 1760, but greatly enlarged since the erection of Bavaria into a kingdom, and which has published its Transactions, since 1763, in German, under the title of *Abhandlungen der Baierischen Akademie*; that of Mannheim, founded in 1755, by the Elector Charles Theodore, and now divided into three classes—historical, physical, and meteorological: the Transactions of the two former of which have been published, under the title of *Acta Academiæ Theodoro-Palatinæ*—those of the last, under that of *Ephemerides Societatis Meteorologicæ Palatinæ*; and the Academy of Suabian History, established at Tübingen, in Wirtemberg.

VIII. SWEDISH AND DANISH ACADEMIES.—The Royal Academy of Sciences, of Stockholm, was originally a private association, founded by Linnæus, and a few of his friends, in 1739, and was not incorporated by the Crown till two years afterwards. Its Transactions appear in quarterly parts, which form an octavo volume a year. The first forty volumes, from 1739 to 1779, are called the *Old Transactions*; those which have appeared since, the *New*. They are written in Swedish, but have also been translated into German. This academy maintains a professor of experimental philosophy, who, with the two secretaries, is paid from the property which the society has acquired by legacies and donations. From the same source, it distributes every year several gold medals and prizes in money. Stockholm also possesses an Academy of the Belles Lettres, founded in 1753; and an institution denominated the Literary Academy of Sweden, founded in 1786. The object of the latter is the cultivation and improvement of the national language. There is an Academy for the investigation of Northern Antiquities, at Upsal, which has published some valuable volumes of Memoirs. The Royal Academy of Sciences of Copenhagen was founded by the Count of Holstein in 1742, and incorporated the following year. Its Transactions appear in Danish; but they have been partly translated into Latin.

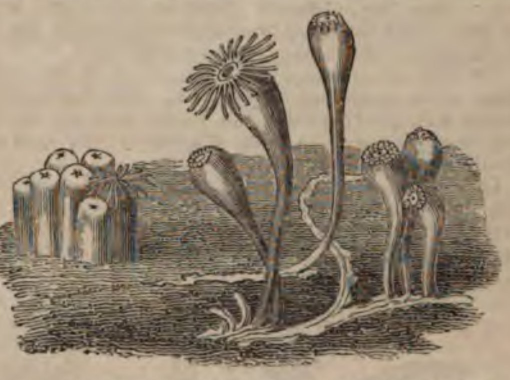
IX. ACADEMIES IN RUSSIA AND POLAND.—The Imperial Academy of Petersburg, like most of the valuable institutions of Russia, originated in the bold and contriving mind of Peter the Great. That monarch, however, did not live to carry into effect the scheme which he had arranged, and which is said to have been suggested to him by his inspection of the academies of France, when in that country in 1717, and to have been matured by consultations with Christian Wolff and Leibnitz. But immediately after his death, in 1725, his successor, Catherine I., proceeded to execute the intentions of her deceased husband; and the Academy was forthwith established, and held its first sitting in December of that year. Some of the most distinguished foreign mathematicians and philosophers of the day were wisely selected by the Empress to grace the new foundation, and induced by liberal salaries to accept places in it under the title of professors. Among them were Wolff, Nicholas and Daniel Bernouilli, Bulfinger, &c. Of these professors there are fifteen in all, besides a president and a director. There are also four adjuncts, from whom vacancies among the professors are always supplied, and who, till thus provided for, are permitted to attend the meetings of the Academy. In its earlier days this institution underwent various fluctuations in reputation and efficiency, according as it happened to be patronized or neglected by the reigning sovereign; but since the accession, in 1741, of the Empress Elizabeth, who placed it upon a broader and more independent basis, it has generally maintained a high character. Its annual revenue is considerable; and one important service, which it has thus been enabled to render, has been the exploration of various portions of the Russian empire, by means of the travellers Pallas, Stolberg, Klaproth, and others, whom it has sent out for that purpose. Its Transactions, down to the year 1747, inclusive, forming fourteen volumes, are in Latin, and are entitled *Commentarii Academiæ Scientiæ Imperialis Petropolitanæ*. Twenty volumes more, down to 1777, likewise in Latin, are entitled *Novi Commentarii*. Since 1777, they take the name of *Acta*, and are partly in Latin and partly in French. Of the whole number of mathematical papers which appeared in these Transactions down to the year 1783, in which he died, the celebrated Euler is computed to have written fully one half; and he left behind him about a hundred additional memoirs, which have appeared in the volumes printed since that period. These papers of Euler's contributed, more than any other publications of the time, to the simplification and improvement of the modern analysis, The Imperial Academy possesses a library of some extent, which contains a considerable number of oriental manuscripts, as well as valuable collections of medals and of specimens of natural history. In 1783, an institution, on the model of the Académie Française, having for its object the improvement of the Russian language, was founded at Petersburg; and was soon after united with the Imperial Academy. A Royal Academy was established at Warsaw in 1753.

Among the other European academies, may be mentioned the Medical Academy of Geneva, founded in 1715; the Académie des Sciences et des Belles Lettres of Brussels, which has published its Transactions, under the title of *Mémoires*, since the year 1777; and the institution of the same name at Flushing, whose Transactions have also appeared. In the British dominions there are no associations for the cultivation of science or learning, which have this name, except the Royal Irish Academy, founded in 1782, and which has published its Transactions since 1787. In North America, as in England, such institutions are, for the most part, called *Societies*, and will be noticed under that term. The following are the only academies which we find enumerated in the *Encyclopædia Americana*, published in 1829:—the American Academy of Arts and Sciences, established at Boston in 1780, which had in 1829 published four volumes of Transactions; the Connecticut Academy of Arts and Sciences, founded at Newhaven in 1799, which had then published one volume; and the Academy of Natural Science, founded at Philadelphia in 1818, of whose Memoirs five volumes had appeared.

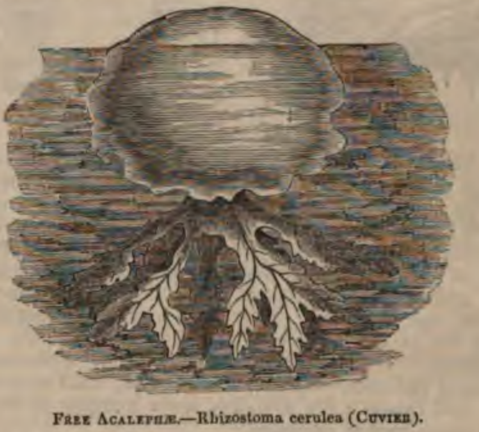
ACADEMY is also the name usually given, both in this country and on the Continent, to an institution established for the cultivation and promotion of the fine arts, that is, of painting, sculpture, architecture, and music. Such institutions commonly partake both of the character of academies, in the sense already explained, and of schools or colleges, consisting, on the one hand, of an association of amateurs and distinguished proficients, professing to have in view the diffusion of a taste for the arts among the public generally, by publications, exhibitions, or any other means which may be made available for that end; and, on the other, of an establishment of teachers or professors, for the instruction of youth in the practice of some one or more of the branches in question. The latter object is effected by lectures, by prescribed tasks, and by the distribution of prizes and honours. Societies of painters, for the promotion and protection of their art, are of very ancient date. So early as the year 1345, the painters of Venice are recorded to have formed themselves into an association of this description. A few years afterwards, —namely, in 1350—those of Florence did the same. In 1391 the artists of Paris followed the example of their Ita lian brethren, and founded what they called the Academy of St. Luke. This establishment was formally recognized by Charles VII. in 1430; and the privileges which he conferred upon it were confirmed by Henry III. in 1584. In 1613 the Academy of St. Luke formed a union with the Society of Sculptors; and the institution subsisted till the Revolution. Towards the middle of the seventeenth century, however, it had been thrown into the shade by a new association, founded by Lebrun, Corneille, and several others of the painters licensed by the king. A royal edict, in favour of this association, was issued in the beginning of the year 1648; and in 1655 letters-patent were granted to it by Cardinal Mazarin. Some time after, it was allowed a hall in the Louvre; and, finally, in 1663, during the administration of Colbert, there was settled upon it a revenue of 4000 livres annually. In 1671, an Academy of Architecture was established by the same minister. These two establishments were abolished with the other academies at the Revolution; but they have since been revived, and now form together the fourth division of the Institute, under the name of the *Académie des Beaux Arts*. It consists of forty-one members, eight associates, and six corresponding members. A branch of this academy still subsists at Rome, which was established in 1666 by Louis XIV., with a revenue of 35,000 livres. There are also Academies of the Fine Arts in many of the chief provincial towns of France. Of the Italian academies of this description, that of San Luca at Rome was established in 1593, by the eminent painter Frederic Zucchero, who erected an elegant building for it at his own expense. There are others at Milan, Bologna, Parma, and many of the other principal towns. The oldest German Academy of the Fine Arts is that of Nuremberg, founded by Joachim Sandrart, an artist of great ability, in 1662. That of Dresden was established in 1697, and was united with those of Leipzick and Meissen in 1764, when it received the form which it still retains. There are others at Berlin, at Vienna, at Munich, at Weimar, and in various other cities. In Spain an Academy of Painting and Sculpture was established at Madrid in 1753. At Amsterdam, Antwerp, and Brussels, there are similar institutions. The Academy of the Fine Arts at Stockholm was established, in 1733, principally by the exertions of the celebrated Charles Gustavus, Count de Tessin; and that of Copenhagen in 1738, though it was not incorporated till 1754. To this institution the famous sculptor Thorwaldsen was indebted for his early education. The *Académie Imperiale des Beaux Arts* of Petersburgh was founded in 1765 by the Empress Catherine II., who endowed it with a considerable revenue. It consists of six professors of painting, sculpture, and architecture, with an adjunct, or assistant, to each, twenty-four honorary members, six councillors, a president, three rectors, and three adjuncts to the rectors. This institution has greatly contributed to the introduction and dissemination of a taste for the arts in Russia, by the pupils whom it has sent out and supported during their studies in foreign countries. A letter, printed by Steele in the 555th No. of the *Spectator* (the last of the original series), speaks of an Academy of Painting, then (1712) lately established in London. Sir Godfrey Kneller is mentioned as its president. This institution, however, probably soon fell into decay. The present Royal Academy originated in an association of painters, who obtained a charter, in 1765, under the title of the Incorporated Society of Artists of Great Britain. This society, however, was soon after broken up by disputes among its members; and in 1768 the Royal Academy of Arts was incorporated in its stead. It consists of forty artists bearing the title of academicians, of eighteen associates, of six associate engravers, and of three or four individuals of distinction, under the name of honorary members. From the academicians are selected the professors of painting, of sculpture, of architecture, and of perspective; and there is also a professor of anatomy, who is commonly a member of the medical profession. Nine of the academicians are likewise appointed annually to officiate in setting the models, and otherwise superintending the progress of the students. The king is the patron of this institution; but its funds are, we believe, entirely derived from the money paid by the public for admission to the exhibition, which takes place every year, in the months of May and June. A branch of the English Royal Academy was established some years ago at Rome. The Edinburgh Royal Academy of Painting was founded in 1754. A similar institution has recently been established in Dublin, under the title of the Royal Hibernian Academy. An Academy of Ancient Music was established in London so early as the year 1710; but a disagreement among its members occasioned its dissolution after it had existed above twenty years. Some time after this the Royal Academy of Music was instituted, with Handel at its head, and for ten years, during which the operas of that great composer were performed under its superintendence in the Haymarket Theatre, enjoyed splendid success. But discord here also came at length to divide and disperse the professors of harmony; and in the year 1729 the institution was broken up. A new Royal Academy of Music, which holds its meetings in a hall in Tenterden-street, was established in 1822. The French Opera, it may be added, is styled the *Académie de Musique.*

ACA'DIA, by the French called ACADIE, is the genuine Indian name of the present province of Nova Scotia. The chief river of Nova Scotia is still called *Shuben-Acadie*, or the *river of Acadie*. [See NOVA SCOTIA.]

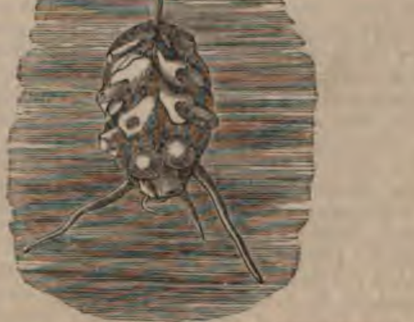
ACALE'PHÆ, a Greek word, signifying nettles. These animals form the third class of Baron Cuvier's zoophytes. Many of them are popularly named *sea-nettles*, from their causing, when touched, a disagreeable sensation similar to the sting of a nettle. Their form is always circular and radiated. There is only one opening into the body, which serves both for the mouth and the vent, and a single cavity which is at once gullet, stomach, and intestines; so that some writers have represented them as being all stomach.



FIXED ACAL.—Alcyonium mammillosum (ELLIS). Actinia sociata (ELLIS).



FREE ACALEPHÆ.—Rhizostoma cerulea (CUVIER).



HYDROSTATIC ACALEPHÆ.—Physophora hydrostatica (FORSKAL).

These animals have been arranged in three orders—1. fixed, 2. free, and 3. hydrostatic.

I. The fixed (*Acalephæ stabiles*) can at pleasure either attach themselves to stones or other objects in the sea, or creep and swim about on the waves. The *Actiniæ* or sea anemones, the *Zoanthæ*, and the *Lucernariæ*, belong to this order.

II. The free (*Acalephæ liberæ*) are not found attached to any object, but always floating about in the water. The *Medusæ* belong to this order.

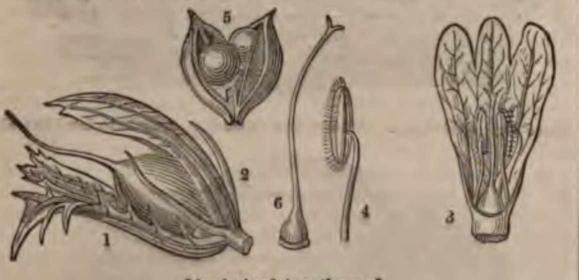
III The hydrostatic (*Acalephæ hydrostaticæ*) are thus named on account of one or more air-vessels, by means of which the animals can raise or sink themselves in the water. Their mouths have not been discovered. The order comprehends the *Physaliæ* and the *Physophoræ*.

In the last edition of the *Règne Animale*, Cuvier makes only two orders—1. The simple (*Acalephæ simplices*); and, 2. The hydrostatic.

M. Eschholtz, of Berlin, has recently published an excellent work on these animals, of which we shall take advantage in describing the several orders.

ACANTHA'CEÆ, a tribe of plants forming one of the natural orders in the Monopetalous division of Dicotyledonous or Exogenous Vegetation. (See DICOTYLEDONES and EXOGENÆ.) Its name is derived from the genus Acanthus, which has been considered characteristic of the whole tribe. The plants of which it is composed are either altogether of an herbaceous nature, or shrubby in a slight degree only; they are extremely common in every tropical country, where they may be considered to occupy the place of the mints, dead-nettles, thymes, and sages of Europe; a few only are found beyond the limits of the tropics. Many of the species are mere weeds; others bear handsome flowers with gaudy colours, but seldom with any odour; a very small number has been occasionally employed medicinally as emollients or diuretics.

The roots of Acanthaceæ are either annual or perennial. The stems are usually four-cornered when young, but afterwards become nearly round; their inside is occupied by a large proportion of pith, which is enclosed in a thin layer of imperfectly formed wood; and at each joint there is a slight tumour with an articulation, by which they are readily known from both Scrophularineæ and Verbenaceæ. Their flowers are often inclosed within large, leafy, imbricated bracteæ (1). The calyx (2) is usually composed of either four or five parts, which overlap each other, and occasionally grow together at the base. The corolla (3) is monopetalous and irregular. The stamens (4) are either two, or four, but in the latter case are of unequal lengths. The pistillum (6) is superior and turoilled. The seed-vessel (5) contains two cells, which burst when ripe, often with elasticity, and expose a few roundish seeds hanging to the cells by curious-hooked processes.



[Analysis of Acanthaceæ.]

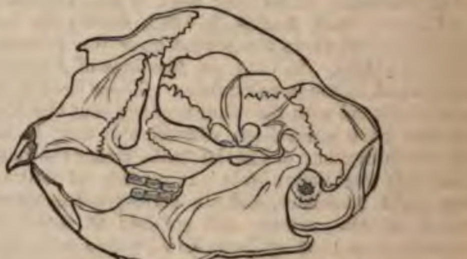
The stems of all the species emit roots very readily from their tumid articulations; on which account gardeners universally increase them by cuttings of the full-grown branches. They are always easy to cultivate, provided they are not kept in too cold or too dry a situation. The annual kinds freely produce seeds, by which they are readily multiplied.

The most common genera are Justicia, Acanthus, Ruellia, Thunbergia, Barleria, and Eranthemum, which see.

For further information, see *Brown's Prodromus Floræ Novæ Hollandiæ*—*Bartling's Ordines Naturales*—*Lindley's Introduction to the Natural System*—and, above all, *Nees v. Esenbeck's Exposition*, in the third volume of *Dr. Wallich's Plantæ Asiaticæ rariores*.

ACA'NTHION, in Zoology, a genus of Rodentia, established by M. F. Cuvier, and embracing two species, which are only known, at present, by their osteology. In the number and form of their teeth, these animals agree in all respects with the common porcupine, from which, indeed, they only differ in the general form or outline of the cranium, and the comparative developement of the bones of the face and skull; characters which have no very assignable influence upon the habits and economy of animal life, and which will, probably, be merged in others of greater importance, when we come to be better acquainted with the species in question. Indeed we have introduced the present article principally for the purpose of attracting the attention of travellers and residents in our Indian Colonies; many of whom have daily opportunities of elucidating this and other obscure subjects in zoology, and only require to be informed of its wants to render the most essential service to the science.

Fig. 1.



To guide observers who may have an opportunity of pursuing this inquiry, we have engraved (*fig.* 1) the skull of a species of porcupine sent from Java by the French traveller, Duvancelle, and figured by M. F. Cuvier, in the ninth volume of the *Mémoires du Museum*, as the type of his genus *Acanthion*.

Fig. 2.

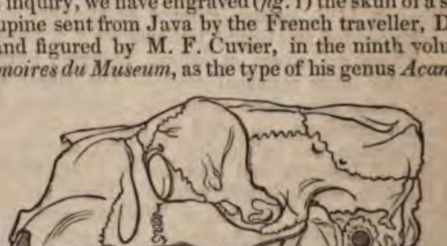


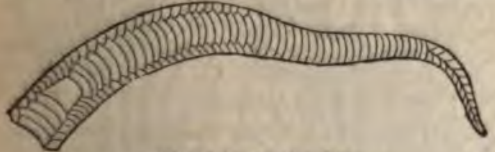
Fig. 2. represents the skull of the common Italian porcupine, for the purpose of comparison. The principal differences which these skulls present, when compared with one another, consist in the surface of the forehead being nearly flat in the acanthion, instead of forming a spherical elevation as in the porcupine; and in the nasal bones being of much smaller dimensions in the former than in the latter animal. The sense of smell would thus appear to be less acute in the Javanese porcupine than in that of Europe and Africa; but it has the region of the brain comparatively larger. M. Cuvier reckons two species:—

1. *The Acanthion Javanicum*, founded upon the skull already mentioned, as having been sent from Java by M. Duvancelle. This is, probably, the *Babi-landak*, mentioned in Marsden's *History of Sumatra*, and which that author identifies with the *Hystrix Macroura* of Linnæus, a species equally obscure. This animal is represented as having five toes on each foot, the body covered with weak spines, and a long tail, terminating in a thick tuft, of which the spines are knotted, and spring out of one another like grains of rice.

2. *The Acanthion Daubentonii*, founded upon a skeleton formerly described by Daubenton, but which he mistook for that of the common porcupine. The locality from which this skeleton was obtained is not exactly known; but there is reason to believe that it was brought from some part of Africa. It may, perhaps, belong to the fasciculated porcupine, which has been lately found to inhabit the Island of Fernando Po; and which, to judge from the external appearance of the living specimen formerly possessed by the Zoological Society, appears to have all the characteristic marks which M. F. Cuvier assigns to the genus Acanthion.

It may be observed, in conclusion, that, besides the common porcupine (which inhabits every part of the Indian Continent, as well as Africa and the South of Europe), the large islands of Borneo, Sumatra, and Java, the Malayan Peninsula, and probably other parts of Eastern Asia, contain three or four different but closely allied species, of which we have, at present, but a very vague and confused account.

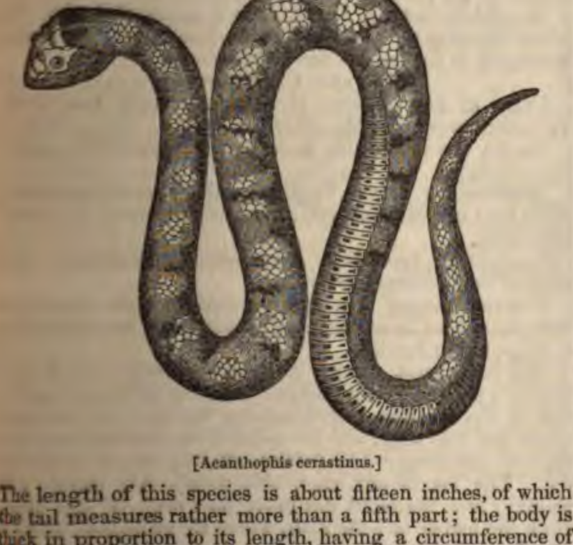
ACA'NTHOPHIS, in Zoology, a genus of venomous serpents, allied to the vipers, but distinguished by having a single series of plates beneath the tail, excepting towards the very extremity, where they are, in some cases, separated into two small rows. The bodies and tails of these animals are elongated and cylindrical; their heads round, obtuse, rather prominent over the eyes, and covered in front with nine or ten polygonal plates. The back and upper surface of the tail are covered with reticulated scales of a rhomboidal form: the breast and belly are covered with single transverse plates; as is likewise the tail, excepting towards the very extremity, which is sometimes furnished with a double row of plates, as in the common viper. The tail is terminated by a little spur, or horny excrescence, which has suggested the name of Acanthophis (that is, *thorn* or *spur* snake), for this genus. This is, however, but a very secondary characteristic, and of little use in distinguishing these animals; since it exists equally in many other species of very different genera, such as the collared, and the black and white snakes, and even in the common viper. It springs out of the very end of the tail, and does not appear to be of the same utility as the two horny spurs which grow upon each side of the anus in the pythons and boas, and which being retractile, or capable of being erected and depressed at will, execute important functions in the economy of these animals.



[Tail of the Acanthophis.]

The head of the acanthophis is broad and compressed, the mouth capable of great distension, and furnished on each side, besides the retractile poison-fangs common to all the family of truly venomous serpents, with a double row of sharp, curved teeth. The species of this genus are of small size, reside on the surface of the dry land, and feed upon frogs, lizards, and small mammals. They are viviparous, and secrete themselve in rat holes, or beneath the roots of trees; never strangle or crush their prey by coiling themselves round its body, but expect a more speedy and certain victory from the deadly effects of their poison. The most anciently known species is,—

The Acanthophis Cerastinus, first described by Merrem, and so named from the general similarity which it bears, at first sight, to the cerastes, or horned viper, in its short body, large flat head, and eyes surmounted by prominent scales.



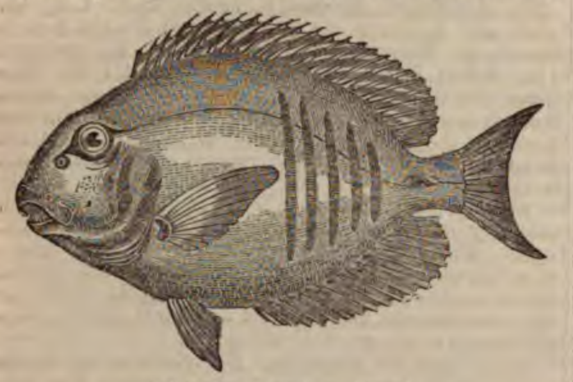
[Acanthophis cerastinus.]

The length of this species is about fifteen inches, of which the tail measures rather more than a fifth part; the body is thick in proportion to its length, having a circumference of two inches and a half in the middle, from whence it gradually tapers towards either extremity. The colour is a pearly-grey above, with obscure transverse dusky or bluish undulations beneath, pale yellow brown, with a small transverse oval black spot on the edge of every abdominal plate; and, in the middle, a similar range of spots from the vent to the end of the tail. The tail itself is cylindrical on the upper surface, and flat beneath, and the spur which terminates it is extremely sharp-pointed, compressed, and slightly bent upwards. The native country of this species is unknown; at least Merrem, who first described it, was ignorant of the country from which his specimen was obtained, and it does not appear to be indicated by any traveller.

The Acanthophis Brownii is briefly described by Dr. Leach, and figured in the first volume of the *Naturalist's Miscellany*. The specific name is given out of compliment to Mr. Robert Brown, the celebrated botanist, from whose manuscripts the brief description of Dr. Leach was taken. The body is said to be of a uniform dark brown, the under lip whitish, the upper with a transverse groove in front, the tail small and rather abruptly contracted at its junction with the body, and the apex compressed laterally. Such, with the additional fact that it is an inhabitant of New Holland, is the very meagre account of this serpent, supplied by Dr. Leach. Mr. Peter Cunningham, however, in his entertaining publication on the present state of New South Wales, informs us, that it is the most venomous serpent of that colony; and suspects that this and a kindred species, of a light orange colour, are male and female, as they have been found to inhabit the same hole. He relates a remarkable fact proving the tenacity of life of these animals. Two individuals, a male and female, were discovered by the dogs of a sportsman: the black one was killed, and the head completely severed from the body, but the female escaped into the hole; upwards of ten minutes afterwards one of the dogs, in hunting about where the snake had been killed, was bitten in the foot by the head which had been cut off, and shortly after died in the most dreadful convulsions.

ACANTHOPTERY'GII, in Zoology, one of the three primary grand divisions, or natural orders, of fishes, which Cuvier has finally established, or rather restored, in his *Histoire Naturelle des Poissons.* (Natural History of Fishes.) This great naturalist has divided fishes into three orders, — *Chondropterygii* (from χόνδρος cartilage, and πτέρυξ a wing or fin), or *Cartilaginous* fishes, without a solid bony skeleton; *Acanthopterygii*, fishes having bony skeletons with prickly spinous processes in the dorsal fins (hence their name); and *Malacopterygii*, (μαλακός, soft, &c.) fishes with bony skeletons, indeed, but with soft articulated radii in the dorsal fins. These three grand divisions, founded upon natural and intelligible principles, because characterized by modifications of organic structure, which exercise an obvious and important influence upon the habits and economy of these animals, were first of all recognized by our celebrated countrymen, Willoughby and Ray. These naturalists were the earliest in the attempt to give a systematic form to zoology, and to raise this branch of knowledge to the rank and importance of a *Science*, by applying to its investigation the principles of the inductive philosophy. The system which these great men had left incomplete and imperfect, a thing unavoidable in all first attempts, was further developed by the celebrated Artedi, in whose hands the three orders above-mentioned became co-ordinate divisions, together with the *Branchiostegi*, since suppressed by Baron Cuvier. After undergoing various changes in the hands of intermediate zoologists, and being even discarded altogether by the school of Linnæus, the system of Artedi is again triumphant; having been lately restored by M. Cuvier, who, after many years devoted to the study of this branch of zoology, and after various attempts to form a system of his own, finally acknowledges that it is the only arrangement conformable to the actual phenomena which we observe among these animals. M. Cuvier divides the acanthopterygious fishes into thirteen natural families, which he calls after the names of their typical or most common genera; but which he has failed to distinguish by exclusive and unequivocal characters. The imperfect state in which he has left his *Histoire Naturelle des Poissons* is not the least to be lamented among the weighty losses which the scientific world has sustained by the recent death of this truly great man.

ACANTHU'RUS (a Greek compound signifying Thorn tail), in Zoology, a genus of Acanthopterygious Fishes, established by Bloch and Lacepede, and adopted by subsequent writers. This genus, separated from the Chætodons of Linnæus, contains, at present, a great number of species, many of which are remarkable for the beauty of their external forms, and the variety of their colours. They are distinguished from proximate genera by the form of the body and tail, which are exceedingly compressed;—so much so, that the depth of the body, measured from the dorsal to the pectoral fins, is always equal to, and often exceeds, its length from head to tail;—by their trenchant teeth, denticulated like a very fine comb; but above all, by the moveable spines, edged and sharp like a lancet, with which they are armed on each side of the tail, and with which they inflict dangerous wounds upon the hands of those who touch them incautiously. It is this circumstance that has acquired for the Acanthuri the name of 'Doctors,' by which they are well known to the English sailors and colonists. These animals have the mouth small, and the muzzle rather advanced: they are among the small number of fishes which live entirely upon vegetable substances, feeding only upon algæ, fuci, and other marine plants; their intestinal canal is, consequently, longer and more complicated than in other species, and their flesh has a peculiar flavour, very different from that of the piscivorous genera. The dangerous weapons with which Nature has provided these otherwise harmless fishes, are well calculated to defend them from the attacks of the ravenous enemies which every where surround them. As they are not obliged to resort to rapine for procuring food, they are by nature inclined to peace, and never voluntarily commence an attack; but they defend themselves with courage and success against the largest of their assailants. Their lancets, also, are placed in the very situation in which, above all others, they are most efficient and dangerous; not only because the greatest strength of fishes lies in the tail, but likewise because it is in this quarter that their enemies are at once most likely to make the attack, and least prepared to expect resistance. The acanthures abound in all the tropical seas, both of the East and West Indies; they are never known to advance beyond the tropics, and are, consequently, unknown in the more temperate latitudes.


[Chætodon Chirengiens. BLOCH.]

ACA'NTHUS (in Architecture). The name by which the broad raffled leaf used in the enrichment of the Corinthian capital is known. It is thus called because of its general resemblance to the leaves of a species of the acanthus plant; or rather because of a pretty traditional story which the Roman author Vitruvius tells of the fancied origin of the Corinthian capital, in which the leaves are said to be imitated from those of the acanthus. (See CAPITAL, CORINTHIAN.) The same leaf, however, is commonly used in architectural and sculptural enrichments generally; in the enrichment of modillions, of mouldings, and of vases, as well as of foliated capitals; and we gather from Virgil, that the acanthus was by the ancients also employed as an ornament in embroidery. In the first book of the *Æneid*, verse 649, and again at 711, a veil or vest is said to be interwoven or embroidered with the crocus-coloured or saffron acanthus.

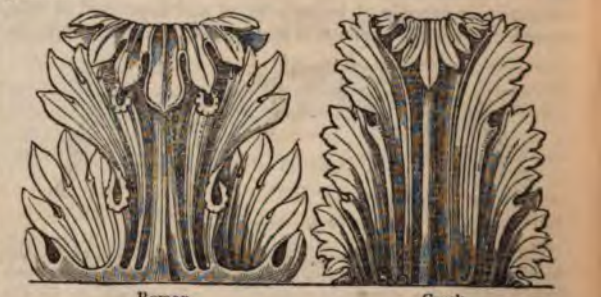
Indeed, it appears to have been a great favourite with that poet himself, both as a plant and as an ornament in works of art. Speaking of the most delightful trees and shrubs for a garden for bees, in the fourth book of the *Georgics*, verses 122 and 123, he says, 'nor could I have passed over in silence the late-blooming narcissus, or the twig of the flexible acanthus;' and in the third eclogue of the *Bucolics*, verse 45, he describes two beautiful beechen cups, on which was carved the scene of Orpheus enchanting the trees, with 'the soft acanthus folded round the handles.'

The application of the brank-ursine acanthus (see next article) to sculptural enrichment is further illustrated in the following passages:—Theocritus, describing a cup of Ætolian manufacture, says, 'the pliant acanthus is expanded *all round the cup*;' and Ovid (*Met.* 13. v. 701.) represents a vase of bronze as being adorned on the outside with a mythological story, and the border above this figured portion as covered with acanthus leaves wrought in gold. Now of these two modes of applying it, as well as of that described by Virgil in his third eclogue, we have very many instances in ancient vases still extant.

Athenæus relates that, in the splendid procession ordained to convey the corpse of Alexander the Great to its final destination in Egypt, the coffin was placed in a car, which was adorned with a small colonnade of golden pillars, and a golden acanthus was set at intervals between the columns.

Pliny the elder, in his *Natural History*, describes the acanthus in such a manner that it can only be recognized in the brank-ursine; and his nephew, in speaking of the successful cultivation of the same plant as an ornament to his garden, leaves no doubt that the brank-ursine is identical with the common architectural and sculptural acanthus.

This ornament, in the ancient Greek and Roman models, is very characteristic of the styles of architectural enrichment of those nations; in the Roman it is full and somewhat luxuriant, and in the Greek more restrained, but simple and graceful.


Roman. Greek.

ACAN'THUS. Under this classical name have been described, by ancient authors, at least three totally different plants. Firstly, a prickly tree with smooth evergreen leaves, and small round saffron-coloured berries, frequently alluded to by Virgil; this is conjectured to have been the *Holly*. Secondly, a prickly Egyptian tree, described by Theophrastus as having pods like those of a bean; it is probable that this was the *Acacia Arabica* (see ACACIA). Thirdly, a herb mentioned by Dioscorides, with broad, prickly leaves, which perish at the approach of winter, and again sprout forth with the return of spring. It is said that the idea of the Corinthian capital of Greek columns was taken from some of the leaves of this acanthus. To this latter plant the name is now applied. The word, in all cases, alludes to the prickly nature of the leaves or stems.

In modern botany, Acanthus is a genus of herbaceous plants found in the south of Europe, Asia Minor, and India, belonging to the natural order *Acanthaceæ*.

GENERIC CHARACTER.

Calyx in four divisions, of which the upper and lower are much larger than the other two.

Corolla one-sided, with three lobes; no trace of an upper lip to be found.

Stamens four, in two lengths; anthers never containing more than one cell, fringed, the upper ones erect, the lower horizontal.

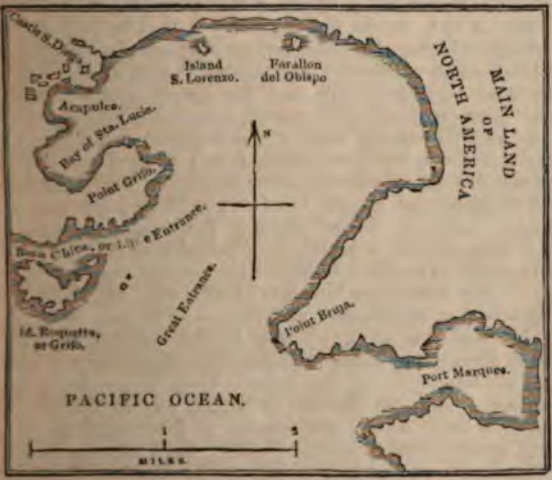
Seed-vessel two-celled, compressed, four-seeded, with sides of the texture of paper.

Flowers growing in a terminal leafless spike, having at their base three floral leaves, of which the intermediate one is fringed with bristles.

The commonest species is *Acanthus mollis*, or *Brank-ursine*, a native of many parts of the South of Europe, growing in shady moist places, among bushes. Its stem is about two feet high, and is covered from the middle to the top with fine large white flowers, slightly tinged with yellow. The leaves are large, soft, deeply cut, hairy, and shining, and surround the lower part only of the stem. Both the leaves and the roots, which are perennial, abound in mucilage, which has caused them to be substituted in domestic medicine for the marsh-mallow. It is this species which is usually supposed to have given rise to the notion of the Grecian capital. But it appears, from the investigation of Dr. Sibthorp, that it is no where to be found, either in the Greek islands, or in any part of the Peloponnesus; and that the plant which Dioscorides must have meant was the *Acanthus spinosus*, still called ἄκανθα, which is found, as he describes it, on the borders of cultivated grounds, or of gardens, and is frequent in rocky moist situations. This species differs from *A. mollis* in having a dwarfer stem, flowers tinged with pink instead of yellow, and spiny leaves, much more deeply cut. Both the one and the other are half-hardy perennials, increased by division of the summit of the root. They have been long cultivated in the gardens of Great Britain, but perish, if not protected, from severe frost.

[Acanthus spinosus.]

ACAPU'LCO, a city in the province of Mexico, about 183 miles S.S.W. of the capital, Mexico; N. lat. 16° 50′, W. lon. 99° 48′. It stands in the recess of a bay, close to a chain of granite mountains, and is the best Mexican port on the coast of the Pacific Ocean. The bay has two entrances formed by the island Roquetta; the comparative dimensions of which may be estimated from the scale attached to the small map. The port is capable of containing 500 ships, and is deep enough to allow vessels to lie close to the rocks.



Acapulco is but poorly built, and is a most disagreeable and unhealthy place. Lying within the torrid zone, and surrounded by mountains, it is intensely hot, and the inhabitants, particularly new comers, are liable to dangerous fevers. Some time back an opening was cut through the rocks on the west to let in the sea-breeze, but a dirty swamp on the east side of the town probably still remains undrained, and is one of the sources of the annual fevers. The city of Mexico, in the interior, communicates with the Pacific by the town of Acapulco, which once had a considerable trade, particularly with Manilla, the capital of Manilla, or Luzon, one of the Philippine islands. Under the Spanish dominion a vessel of the largest size used annually to leave Acapulco for Manilla about February or March, loaded with commodities and specie; and when the English were at war with the Spaniards, the Manilla ships were carefully looked after as a rich booty. The vessel returned to Acapulco in August, carrying back muslins, printed calicoes, coarse cotton shirts, porcelain, Chinese jewellery, &c. Its arrival was the signal for a great concourse of merchants to Acapulco, who swelled the population for the time to about 9000. The monopoly enjoyed by Acapulco while under the dominion of Spain being now abolished, the India and China trade has shifted to the ports of Sam Blas, Mazatlan, and Guaymas; and though its prosperity necessarily suffered by such removal, Mr. Ward, in his *Mexico*, states that its commerce is again reviving. The present number of inhabitants is stated at about 4000, who are principally people of colour. Its exports are cochineal, indigo, silver, and some skins. [See *Dictionnaire Géograph. Universel.*]

ACA'RIDES, a division of ARA'CHNIDES, which comprehends the small spider-like animals popularly termed mites (*Acari*), as well as water-mites and ticks: some of these are wanderers on land or in water; others are fixed upon various animals, whose blood or humours they suck, and even insinuate themselves beneath the skin, and often multiply prodigiously.

These minute animals are not considered by modern naturalists to rank among insects, on account of their structure being very different, and from their having, in most cases, like spiders, eight feet, while no insect has more than six feet. Their mouths, in some, are furnished with jaws (*mandibulæ*), either having pincers or claws, but concealed in a projection of the breast-plate (*sternum*) in form of a lip; in others it is in the form of a syphon or sucker; and in others it presents a simple cavity. M. Latreille makes four divisions of the *Acarides*: 1. Mites (*Trombidites*): 2. Ticks (*Ricinites*): 3. Water Mites (*Hydrachnellæ*): and 4. Flesh Worms (*Microphthira*); the latter distinguished from the other three by having only six feet.

ACARNA'NIA, an ancient division of Northern Greece, which was bounded on the north by the Ambraciot Gulf, now the gulf of Arta, on the north-east by the small territory of Amphilochia, and on the west and south-west by that part of the Mediterranean to which the Greek and Roman writers gave the name of the Ionian Sea. The eastern boundary is not so easy to determine. It extended in the time of Thucydides east of the river Achelous, and encroached upon the territory which seemed the property of the Ætolians. Under the Romans, or somewhat earlier, the Achelous was made the dividing line. Acarnania afterwards became part of the Roman province of Epirus, and Ætolia was attached to the province of Achæa. Acarnania, it is now supposed, will form part of the new kingdom of Greece. It has sometimes been called by the name of Carlelia, or Carnia, in modern times, which appears to be a corruption of the ancient name.

The longest straight line that can be drawn in Acarnania is about fifty miles, from Actium to the mouth of the Achelous. The length of sea-coast from Actium, near the entrance of the Ambraciot Gulf to the mouth of the Achelous, is reckoned, by Strabo, to be about 570 stadia, or 57 miles, reckoning 10 to a mile. Our modern charts give a length of from 70 to 80 miles, measuring in a rough way, along the very irregular outline of the coast. Several good ports are found on this coast, which, added to the general fertility of the country, might have made the people wealthy; but the primitive inhabitants never attained any reputation either in commerce, or the arts, sufficient to transmit their fame to our days. Their best ports were occupied by Corinthian colonies; and the inhabitants, engaged in continual wars with their neighbours, are characterized by Thucydides as living in a state of piracy and robbery, at a time when Athens (which was not 150 miles from the mouth of the Achelous) had seen the dramas of Æschylus and Sophocles, and was adorned with the great works of Phidias.

Thucydides, who wrote during the Peloponnesian war (which commenced B.C. 431), is the earliest extant writer who gives us any exact information about a people called Acarnanians, inhabiting the country which we have called Acarnania. It is difficult to give, in a limited space, any definite or correct idea of the origin of many of the Greek nations. The Acarnanians are never mentioned by Homer, though their neighbours and brethren, the Ætolians, are; and this would tend to prove that the name of Acarnanians as the name of a people, is not so old as the time of Homer. They belonged, probably, at least in part, to an old and widely diffused race called the Leleges; and, by gradual intermixture with Hellenic (Greek) stock, became, to a certain extent, a Greek people. In the course of time they formed a kind of union and civil polity, which Aristotle thought worth describing; but his work is lost.—[See Ætolians.]

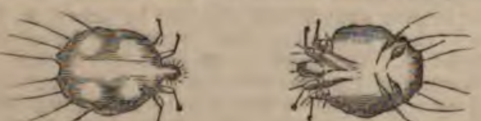
We have hardly attempted any description of the interior of this country, because it is next to impossible to state anything about it that is either very precise or important. In its present wretched condition, it is very thinly inhabited, and very little cultivated. There can be no doubt that it contains a considerable portion of good soil; and we have lately been informed, on trustworthy evidence, that among its mineral treasures are sulphur and coal. There are several lakes in Acarnania.

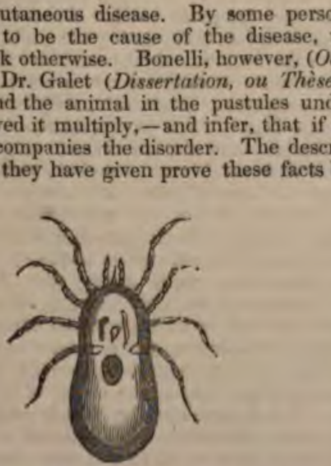
Bordering on Acarnania, on the north-east, was the small territory of Amphilochia, which, with its capital Argos, was sometimes reckoned a part of Acarnania, owing to the political connexion between the two people. It lay on the south-east and eastern coast of the Ambraciot Gulf; and its eastern boundary may have been the Achelous, or rather the mountain chain, which here forms the western margin of the basin of that river. Tradition named Amphilochus, the son of Amphiaraus, as the founder of the state of Amphilochia, and of its capital Argos, after his return from the war of Troy. [See Argos.] Amphilochia, together with Acarnania, became part of the Roman province of Epirus.—[See Actium.]

A'CARUS. The mite, a genus of insects belonging to the Acarides, under which Linnæus comprehended a great number of rather heterogeneous species. M. Latreille (*Règne Animal*, edit. 1829) confines the generic name to the species which have the feelers (*palpi*) forked, very short or concealed, the body very soft, or without a scaly crust. The feet have, at their extremity, a vesicular cushion. Among these species are enumerated the following:—

The domestic mite (*Acarus domesticus*, De Geer), is very commonly found in collections of insects and stuffed birds, and is exceedingly destructive to cabinets. The effluvia of camphor has some effect in destroying this pest, but is not powerful enough to prevent it altogether. Moistening the specimens with a weak solution of corrosive sublimate, is said to prove an effectual preventive.

The itch mite (*Acarus Scabiei*, Fabricius) is a microscopic animal, found under the human skin in the pustules of a well-known cutaneous disease. By some persons the insect is believed to be the cause of the disease, though many authors think otherwise. Bonelli, however, (*Observations*, p. 67) and Dr. Galet (*Dissertation, ou Thèse inaugurale*), have found the animal in the pustules under the skin,—have observed it multiply,—and infer, that if it does not produce, it accompanies the disorder. The descriptions and figures which they have given prove these facts beyond question.

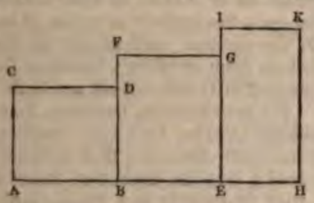


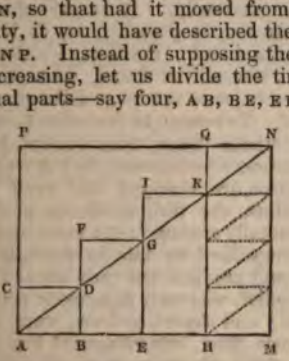


The sparrow mite (*Acarus passerinus*, Fabricius) is distinguished by the remarkable size of its third pair of legs. Geoffroy called it the bat tick, and Latreille formerly placed it in his genus *Sarcoptes*, now abandoned. Baron de Geer has given a good description of it with figures. (Tom. vii. Tab. 6.)

ACCELERATED MOTION, ACCELERATING FORCE, ACCELERATION. When the velocity of a moving body is continually increased, so that the lengths described in successive equal portions of time are greater and greater, the motion is said to be accelerated, which is the same thing as saying that the velocity continually increases. [See Velocity.] We see instances of this in the fall of a stone to the earth, in the motion of a comet or planet as it approaches the sun, and also in the ebb of the tide. As it is certain that matter, if left to itself, would neither accelerate nor retard any motion impressed upon it, we must look for the cause of acceleration in something external to matter. This cause is called the *accelerating force*, see Inertia, Force, Cause, to the remarks in the last of which articles we particularly refer the reader, both now and whenever the word cause is mentioned. At present the only accelerating forces which we will consider, are the action of the earth, and the various weights produced by it.

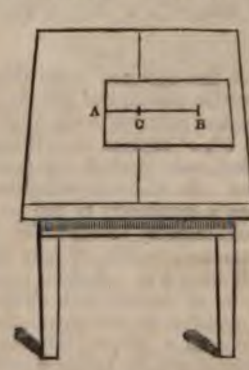
It is observed, that when a body falls to the ground from a height above it, the motion is *uniformly* accelerated; that is, whatever velocity it moves with at the end of the first second, it has half as much again at the end of a second and a half; twice as much at the end of two seconds; and so on. · At least this is so nearly true, that any small departure from it may be attributed entirely to the resistance of the air, which we know from experience must produce some such effect. And this is the same with every body, whatever may be the substance of which it is composed, as is proved by the well-known experiment of the guinea and the feather, which fall to the bottom of an exhausted receiver in the same time. The velocity thus acquired in one second is called the measure of the accelerating force. On the earth it is about 32 feet 2 inches per second. If we could take the same body to the surface of another planet, and if we found that it there acquired 40 feet of velocity in the first second, we should say that the accelerating force of the earth was to that of the planet in the proportion of $32\frac{1}{6}$ to 40. By saying that the velocity is $32\frac{1}{6}$ feet at the end of the first second, we do not mean that the body falls through $32\frac{1}{6}$ feet in that second, but only that if the cause of acceleration were suddenly to cease at the end of one second, the body would continue moving at that rate. In truth, it falls through only half that length, or $16\frac{1}{12}$, in the first second. It may be proved mathematically, that if a body, setting out from a state of rest, has its velocity uniformly accelerated, it will, at the end of any time, have gone only half the length which it would have gone through, had it moved, from the beginning of the time, with the velocity which it has acquired at the end of it. Thus, if a body has been falling from a state of rest during ten seconds, (the resistance of the air having been removed,) it will then have a velocity of $32\frac{1}{6} \times 10$ or $321\frac{2}{3}$ feet per second. Had it moved through the whole ten seconds with this velocity, it would have passed over $321\frac{2}{3} \times 10$ or $3216\frac{2}{3}$ feet. It really has described only the half, or $1608\frac{1}{3}$ feet. We may give an idea of the way in which this proposition is established, as follows:—The area of a rectangle [See Rectangle], that is, the number of *square feet* it contains, is found by multiplying together the numbers of *linear feet* in the sides. Thus, if AB be 4 feet, and AC 5 feet, the number of square feet in the area is 4 × 5, or 20. Again, the number of feet described by a body moving with a uniform velocity, for a certain number of seconds, is found by multiplying the number of seconds by the number of feet per second, or the velocity. If, then, AB contain as many feet as there are seconds, and AC as many feet as the body moves through per second; as many feet as the body describes in its motion, so many square feet will there be in ABDC. That is, if we let AB *represent* the time of motion, and AC the velocity, the area ABDC will *represent* the length described in the time AB, with the velocity AC. Not that ABDC is the length described, or AB the time of describing it; but AB contains a foot for every second of the time, and ABDC contains a square foot for every foot of length described. Similarly, if at the end of the time just considered, the body suddenly receives an accession of velocity DF, making its whole velocity BF per second; and if with this increased velocity it move for a time which contains as many seconds as BE contains feet, the length described in this second portion of time will contain as many feet as BEGF contains square feet: and the whole length described in both portions of time will be represented by the sum of the areas ABDC and BEGF. And similarly for another accession of velocity GI, and an additional time represented by EH. Now, let a body move for the time represented by AM; at the beginning of this time let it be at rest; and by the end, let it have acquired the velocity MN, so that had it moved from the beginning with this velocity, it would have described the length represented by AMNP. Instead of supposing the velocity to be perpetually increasing, let us divide the time AM into a number of equal parts—say four, AB, BE, EH, HM, and let one-fourth of the velocity be communicated at the beginning of each of these times, so that the body sets off from A, with the velocity AC, which continues through the time represented by AB, and causes it to describe the length represented by ABDC. We know from geometry [See TRIANGLES, SIMILAR] that BD, EG, and HK, are respectively one-fourth, one-half, and three-quarters of MN, which is also evident to the eye, and may be further proved by drawing the figure correctly, which we recommend to such of our readers as do not understand geometry. Hence GE or BF is the velocity with which the body starts at the end of the time AB; EI at the end of AE; and HQ at the end of AH. Consequently, the whole length described is a foot for every square foot contained in ABDC, EBFG, EIKH, and HQNM, put together. But this is not a uniformly accelerated velocity, for the body first moves through the time AB, with the velocity AC, and then suddenly receives the accession of velocity DF. But if, instead of dividing AM into four parts, we had divided it into four thousand parts, and supposed the body to receive one four-thousandth part of the velocity MN at the end of each of the parts of time, we should be so much nearer the idea of a uniformly accelerated velocity as this, that instead of moving through one-fourth of its time without acquiring more velocity, the body would only have moved one four-thousandth part of the time unaccelerated. And the figure is the same with the exception of there being more rectangles on AM, and of less width. Still nearer should we be to the idea of a perfectly uniform acceleration if we divided AM into four million of parts, and so on. Here we observe, 1. that the triangle ANM is the half of APNM; 2. that the sum of the little rectangles ACDB, BFGE, is always greater than the triangle ANM, by the sum of the little triangles ACD, DFG, &c.; 3. that the sum of the last-named little triangles is only the half of the last rectangle HQNM, as is evident from the inspection of the dotted part of the figure. But by dividing AM into a sufficient number of parts, we can make the last rectangle HQNM as small as we please, consequently we can make the sum of the little triangles as small as we please, that is, we can make the sum of the rectangles ACDB, &c., as near as we please to the triangle ANM. But the more parts we divide AM into, the more nearly is the motion of the body uniformly accelerated; that is, the more nearly the motion is uniformly accelerated, the more nearly is ANM the representation of the space described. Hence we must infer (and there are in mathematics accurate methods of demonstrating it), that if the acceleration were *really* uniform, ANM would really have a square foot for every foot of length described by the body. That is, since ANM is half of APNM, and the latter contains a square foot for every foot of length which *would have been* described if MN *had been* the velocity from the beginning, we must infer that the length described by a uniformly accelerated motion from a state of rest, is half that which would have been described, if the body had had its last velocity from the beginning.





If the body begins with some velocity, instead of being at rest, the space which it would have described from that velocity must be added to that which, by the last rule, it describes by the acceleration. Suppose that it sets out with a velocity of 10 feet per second, and moves for 3 seconds uniformly accelerated in such a manner as to gain 6 feet of velocity per second. Hence it will gain 18 feet of velocity, which, had it had at the beginning, would have moved it through 18 × 3 or 54 feet of length, and the half of this is 27 feet. This is what it would have described had it had no velocity at the beginning; but it has 10 feet of velocity per second, which, in 3 seconds, would move it through 30 feet. Hence 30 feet and 27 feet, or 57 feet, is the length really moved through in the 3 seconds.

Similarly we can calculate the effects of a uniform *retardation* of velocity. This we can imagine to take place in the following way. While the body moves uniformly from left to right of the paper, let the paper itself move with a uniformly accelerated velocity from right to left of the table. Let the body at the beginning of the motion be at the left edge of the paper, and let that edge of the paper be placed on the middle line of the table. Let the body begin to move on the paper uniformly 10 inches per second, and let the paper, which at the beginning is at rest, be uniformly accelerated towards the left, so as to acquire 2 inches of velocity in every second. At the end of 3 seconds, the body will be at B, 30 inches from A, but the paper itself will then have acquired the velocity of 6 inches per second, and will have moved through the half of 18 inches or 9 inches; that is, AC will be 9 inches. Hence the distance of the body from the middle line will be CB, or 21 inches. Relatively to the paper, the velocity of the body is uniform, but relatively to the table, it has a uniformly retarded velocity. At the end of the fourth second, it will have advanced 40 inches on the paper, and the paper itself will have receded 16 inches, giving 24 inches for CB. At the end of the fifth second, AB will be 50 inches, AC 25 inches, and CB 25 inches. At the end of the sixth second, AB will be 60 inches, AC 36 inches, and BC 24 inches, so that the body, with respect to the table, stops in the sixth second, and then begins to move back again. We can easily find when this takes place, for, since the velocity on the paper is 10 inches per second, and that of the paper gains 2 inches in every second, at the end of the fifth second the body will cease to move forward on the table. At the end of 10 seconds it will have returned to the middle line again, and afterwards will begin to move away from the middle line towards the left. At the end of the twelfth second, it will have advanced 120 inches on the paper, and the paper will have receded 144 inches, so that the body will be 24 inches on the left of the middle line.



The general algebraical formulæ which represent these results are as follow. Let a be the velocity with which the body begins to move, t the number of seconds elapsed from the beginning of the motion, g the velocity acquired or lost during each second. Then the space described in a uniformly accelerated motion from rest is $\frac{1}{2}gt^2$; when the initial velocity is a, the space described in an accelerated motion is $at+\frac{1}{2}gt^2$, and in a retarded motion the body will have moved through

$at-\frac{1}{2}gt^2$ in the direction of its initial velocity if at be greater than $\frac{1}{2}gt^2$, or will have come back and passed its first position on the other side by $\frac{1}{2}gt^2-at$, if at be less than $\frac{1}{2}gt^2$. In the last case it continues to move in the direction of its initial velocity for $\frac{a}{g}$ seconds and proceeds in that direction through the space $\frac{1}{2}\frac{a^2}{g}$.

For further explanation as to velocities which are accelerated or retarded, but not uniformly, see VELOCITY.

ACCELERATION *of the Moon's Mean Motion.* } See PLANETARY PERTURBATIONS.
ACCELERATION *of the Motion of Comets.* }

ACCENT (in Mathematics). To avoid the confusion arising from the use of many letters in an algebraical problem, and on other accounts, it is customary to signify different magnitudes of the same kind, or magnitudes similarly connected with the question, by the same letter, distinguishing these magnitudes from one another by accents. It is, therefore, to be understood, that the same letter with two different accents, may stand for magnitudes as different in value as those represented by different letters. The convenience of the accent may be illustrated as follows. If a men can do b things in c days, and e men can do f things in g days, we have the following equation:—

$$afc = ebg.$$

Now, instead of using e, f, and g, in the second part of the question, let us use the letters which stood for the corresponding quantities in the first part, with accents; that is, let a' men do b' things in c' days. The equation then becomes

$$ab'c = a'bc'.$$

In this new form of the equation some things are evident to the eye, to ascertain which, had the first equation been used, we must have had recourse to the question itself. For instance, that if a'', b'', c'' express men, things, and days, as above, $ab''c = a''bc''$, only placing two accents now where there was one before. In many investigations the judicious use of accents gives a symmetry to the processes and expressions which could scarcely be otherwise obtained.

For the unmathematical reader, we may illustrate the use of accents in the following way. Let us suppose a bookcase to consist of four rows of shelves, each divided into six compartments. If we call the six compartments in the lowest range, A, B, C, D, E, and F, respectively, we might let the compartment directly over A be called G, and so on; but it would be much simpler and easy of recollection to call this compartment A′, the one over *it* in the third row A″, and so on. Thus each letter would indicate a certain vertical line of compartments, while the accent would point out in which horizontal line the one designated is to be found. This is precisely the mathematical use of the accent. All quantities of the same kind, or which the problem places in similar positions, are designated, with regard to this question, by the same letter.

The accented letter a' is read *a accented*, or *a dashed*; a'' is read *a twice accented*, or *a twice dashed*, or more conveniently, though without much attention to idiom, *a two dash*, &c.; where accents become too many to be used with convenience, the *Roman* figures are substituted for them. Thus a^{iv} would be used for a''''. The Roman figures prevent this being taken for a^4, or a multiplied three times by itself. The young algebraist should be cautious how he uses accents, until experience has taught him to do so with propriety. The accented letter is the *metaphor* of algebra; and expressions of the greatest symmetry may be deprived of all their beauty, and even much of their meaning, by a wrong use, or even a want of this notation.

ACCENT. When a child begins to read, he is apt to pronounce all the syllables of a word in the same key, with the same loudness and clearness, dwelling the same time upon each, and pausing the same time between each pair. He soon, however, learns that, in nearly every word, there is one syllable at least which must be distinguished from the rest by a more impressive utterance, as in the examples *respéct, respéctful, respéctable.* If the word is a long one, it requires a second accent, as *respéctability, mánufáctory, immórtalíze.* On the other hand, when short words come together, one or two are often devoid of accent, as in the phrase *ón the tóp of a hill.* When it is stated that the accented syllable is pronounced more impressively than the rest, it is not meant that all accented syllables are to be equally impressive. In the examples given above, the first accent in *mánufáctory* seems to be weaker than that on the third syllable; so the last accent in *immórtalíze*, and that attached to the preposition *on*, among the six monosyllables, *ón the tóp of a hill*, are comparatively very faint. The consideration of accent often determines whether or not we pronounce the initial *h* [See A or AN]; and, consequently, whether the article *an* or *a* is to be used before such a word. Upon accent depends the melody of verse, at least in modern languages. Of the ancient, particularly the Greek accent, it is better to abstain from speaking, because the opinions of people on the subject of Greek accent are both unsettled and contradictory. We may remark, however, that it is the practice of the modern Greeks, in a very great number of instances, to put the chief stress on that syllable which, in our printed Greek books, has the accentual mark (′) on it; but, in doing this, they frequently and unavoidably neglect the stress on those syllables which we are accustomed to pronounce most emphatically. It is said that the principle of Greek versification is *quantity*, or, as it is defined, the mere duration of a sound. Possibly, on a closer examination of the question, it would be found, that what the ancients meant by *quantity*, was not very different from what we mean by *accent*. To return to the safer ground of our own language, the reader of our older writers, Shakspeare and Milton, for instance, should know that the accents of words from time to time are changed, and even variable at the same time. Thus, the verb which we call *tríumph*, was with Milton generally *triúmph*; the noun and the verb being commonly distinguished by him in the same way as *próduce* the noun and *prodúce* the verb are at the present day. What we call *spírit*, was with him more commonly *spiríte*, or almost *spríte*; and *áspect, prócess*, were *aspéct, procéss.* Even in our own time, *advertísement* has become *advértisement*. In these changes, the usual tendency in our language is, and has been, to throw the accent farther back from the end of the word. Such a tendency is, perhaps, inherent in all languages, and seems to arise solely from an endeavour to save labour by rapidity of utterance.

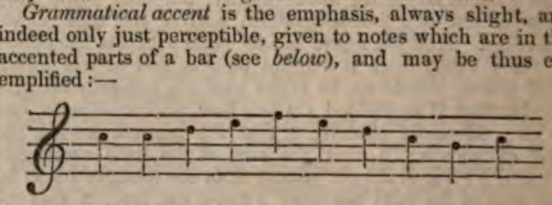
The symbols employed to denote accents are three, the acute (´), the grave (`), and the circumflex (ˆ). We have hitherto spoken only of the first. The second in the ancient languages is said to denote the opposite to the acute, or, perhaps, the absence of it; while the circumflex, we are told, marks a compound of the two, first a rising and then a falling of the voice in the articulation of the same syllable.

These three little marks, as employed in the orthography of the French language, have a signification altogether different. As the French, like all other languages, is deficient in the number of characters used to mark the vowel sounds, it has been found convenient to employ the three symbols given above. Thus, the sounds of *e, é, è, ê*, in the mouth of a Frenchmen, differ not so much in point of *accent* as in the real articulation.

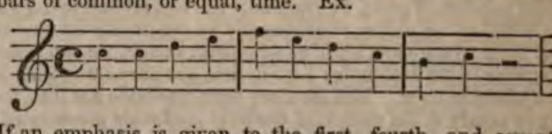
Emphasis differs from *accent*, and is properly used with reference to some one word, or part of a sentence, to which a speaker wishes to draw attention by giving it a more marked pronunciation. (See EMPHASIS.)

ACCENT, in Music, signifies, in a general sense, emphasis, and is either grammatical or oratorical.

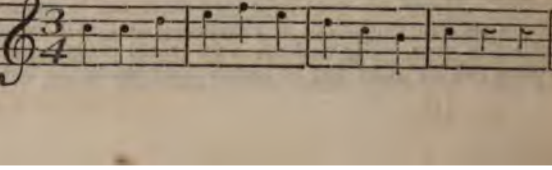
Grammatical accent is the emphasis, always slight, and indeed only just perceptible, given to notes which are in the accented parts of a bar (see *below*), and may be thus exemplified:—



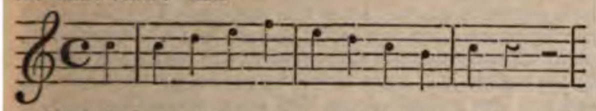
Now, without accent, these notes would have no measure, that is, would not be in any musical time; but if the first, fifth, and ninth are accented, the whole will be divided into bars of common, or equal, time. Ex.



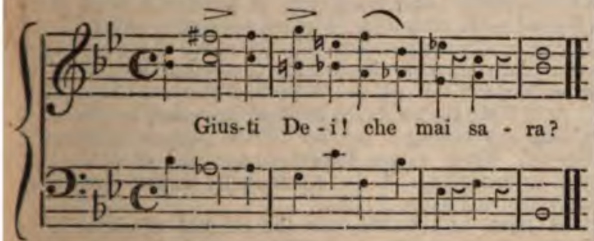
If an emphasis is given to the first, fourth, and seventh notes, the series will divide into bars of triple time. Ex.



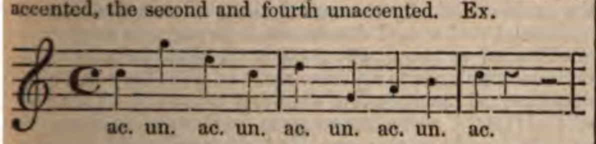
Again, an entirely different effect will be produced by throwing the accent on the first, third, fifth, &c., notes of the same series. Ex.



Oratorical accent is expression—is the accent dictated by feeling—and not confined to any particular part of the bar. It often is required, though the composer may not have marked it by any sign, but left it to the knowledge and taste of the performer to discover and enforce. Commonly, however, the terms *rinforzato* (strengthened), and *sforzato* (violently forced), are used for the purpose, though these participles are too often thought synonymous. An acute angle (>) is also employed to indicate such emphasis. The annexed passage, from Mozart's *Figaro*, is an example of oratorical accent, the stress being laid on notes in both the unaccented and accented parts of the bar, the words 'Giusti Dei!' (Just Gods!) demanding strong expression:—

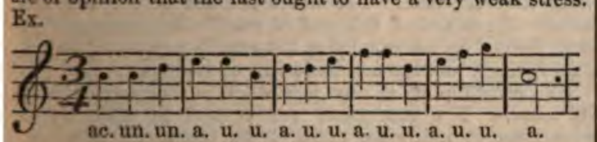


ACCENTED PARTS OF A BAR, in Music, are such as naturally require some emphasis. In common time, the bar of which is divided into four parts, the first and third are accented, the second and fourth unaccented. Ex.



If the movement is very slow, the accent will fall on the first, third, fifth, and seventh parts,—on every other quaver.

In triple time of three crotchets, the accent is on the first; the second and third are unaccented. Though some writers are of opinion that the last ought to have a very weak stress. Ex.



In three-quaver time the accent is on the first quaver only. In six-quaver time, it is on the first and fourth quavers. Nine-quaver and twelve-quaver times, which are only multiples of the two former, follow the same rule as those. The extremes, however, of slowness and quickness in times, though not altering their names, change the number of accented parts. Thus, as we have before remarked, each bar of common time in an *adagio* (a very slow movement) has four accented parts; and when six-quaver time is very rapid, or *presto*, the first note in each bar is alone accented. The various times (as well as the many clefs) ought to be reduced in number, by which the laws of accent might be much simplified, and confined to two very plain rules. [See CLEF and TIME.]

ACCEPTANCE. [See BILL OF EXCHANGE.]

ACCESSARY (from the low Latin *accessorius vel accessorium*), is, in law, one who is guilty of a felonious offence, not as chief actor, but as a participator without being present at the time of the actual committing of the offence, as by command, advice, instigation, or concealment, &c.

A man may be accessary either before the fact, or after it.

An accessary *before the fact* is defined by Lord Hale to be one who, "being absent at the time of the crime committed, doth yet procure, counsel, or command another to commit a crime." The absence of the offender is necessary to constitute him an accessary, as otherwise he would be a principal; and he must have procured the commission of the crime, either by direct personal communication with the actual perpetrator, or by conveying his advice or command through some indirect channel. But the mere concealment of a felony intended to be committed, without actual instigation, will not make a man an accessary; as that is only a misprision of felony. It is an established rule, that where a man commands another to commit an unlawful act, he is accessary not merely to the act commanded, but to all the consequences that may ensue upon it, except such as could not in any reasonable probability be anticipated or feared: as, for instance, if he commands another violently to beat a third person and he beats him so that he dies, the person giving the command is guilty as accessary to the murder consequent upon the act, notwithstanding that it may never have been his intention that a crime of so deep a dye should be committed. But a man will not be guilty as accessary before the fact if he command another to kill A, and he kills B, knowing that it was not A, because the particular crime he contemplated has never been completed. It is otherwise where the directions have been *substantially* pursued, although the crime may not have been committed precisely in the *manner* in which it was commanded to be done, as where a murder is effected by means of stabbing instead of poisoning.

An *accessary after the fact* is one who, knowing that a man has committed a felony, receives, relieves, or assists him. In general, any assistance given to a felon to hinder his being apprehended, tried, or suffering punishment, as by affording him the means to escape the pursuit of justice, will constitute the assister an accessary after the fact; but it is not so if the assistance given have no such tendency, as when clothes or necessaries are supplied to a felon in gaol. Although any *act done* to enable the criminal to escape the vengeance of the law will make a man guilty as accessary after the fact, a mere omission to apprehend him, without giving positive assistance, will not have that effect. Also, if the crime be not completed, at the time of the relief or assistance afforded, the reliever or assister is not adjudged an accessary to it; as where a mortal wound has been given, but the murder is not then consummated by the death of the party: yet, the crime once complete, not even the nearest ties of blood can be pleaded in justification of concealment or relief, except alone in the case of a wife, whom the law supposes to be so much under the coercion of her husband, that she ought not to be considered as accessary to his crime, by receiving him after it has been committed.

By the late statutes of 7 and 8 George IV., the punishment of accessaries before the fact is assimilated to that which is by law inflicted on the principal; and accessaries after the fact are made punishable with imprisonment proportioned to the heinousness of the original crime, but in no case is the imprisonment to exceed two years. The offence of receiving stolen goods is by those statutes specially provided for, and those who are convicted of it are made liable to fourteen years' transportation.

Formerly no accessary could be tried until after the conviction of the principal, the crime of the former being regarded as, in a manner, dependent on that of the latter; but in the present day the law is greatly altered in this respect. It is now competent to try and convict him, either as accessary, or for a distinct substantive felony, without waiting for the conviction of the principal, who may not be within the reach of justice, or who may, perhaps, have been acquitted through accidental failure of evidence.

It remains to be observed, that the distinction between principals and accessaries holds only in cases of felony.

ACCIDENT, see PREDICABLES.

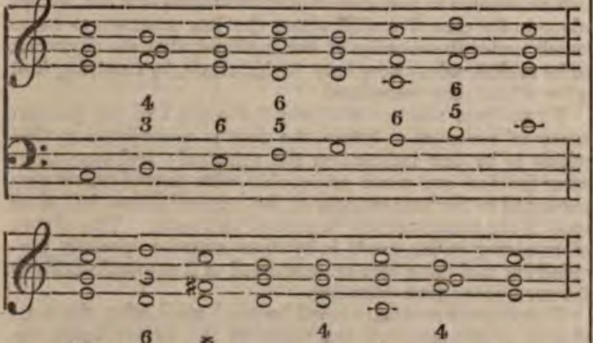
ACCIPENSER, in Zoology, a genus of fishes. [See STURGEON.]

ACCOLA'DE. This French word, derived from the Latin *ad*, to, and *collum*, the neck, signifies, in familiar speech, an embrace; and this idea, or that of union by means of the neck, as when two oxen are yoked together, is that which prevails in various other derivatives from the same root, both in the French and Italian languages. Some, accordingly, have supposed that, when used as descriptive of a certain part of the ancient ceremony of conferring knighthood, the particular act which it denoted was the *embrace*, accompanied with a kiss, which was bestowed upon the new-made knight, in token of the brotherhood established between them by his admission into the order of chivalry. It has, however, been the more generally-received opinion, that the accolade was what we call in English (though perhaps improperly) the dubbing, the slight blow given to the cheek or shoulder of the knight, 'as an emblem,' to use the language of Gibbon, 'of the last affront which it was lawful for him to endure.' There is no doubt as to the great antiquity of this last-mentioned custom. Gregory of Tours, writing in the sixth century, describes the blow on the shoulder as part of the ceremony with which the kings of France, of the first race, were wont to confer the honour of knighthood. It has been derived, by some antiquaries, from the blow which the Roman slave received from his master when manumitted, or made a freeman. The blow of liberation, indeed, whatever may have been its original import, may be traced in various directions among the usages of the middle ages. In Germany, up to comparatively recent times, noblemen were wont to confer upon a slave the right of bearing arms by striking him. The act was called *wehrhaft machen*, that is, to make him capable of bearing arms. And in the same country it is still, in many places, the practice for the apprentice to receive a blow from the oldest journeyman when, by the termination of his apprenticeship, he becomes a freeman, and a member of the guild. The blow by which knighthood was conferred seems to have been originally given with the hand, for which the flat part of the sword was afterwards substituted.

ACCOMPANIMENT, in Music, is the subordinate part, or parts, accompanying a voice, or several voices, or a principal instrument, &c. The piano-forte or guitar part of a song is the accompaniment, the air itself being the principal, the other only the useful ally, the support. In a concerto the whole band accompany the instrument for which the chief and prominent part is composed, except in the *tutti* parts, (*i.e.*, those portions of the concerto in which the principal instrument rests,) then the orchestral parts take the form of a full piece.

Accompaniment is also the harmony of a figured base, or another word for what is, by a foolish, unmeaning term—but too generally adopted to be at once discarded—called *thorough-base.*

The *Accompaniment of the Scale* is the harmony assigned, partly by what may be called nature and partly by custom, to that series of notes denominated the *diatonic scale* ascending and descending, such scale being taken as a base. Ex.



The diatonic scale adopted as a melody has one simple accompaniment, consisting almost exclusively of common chords; but it is also susceptible of many different harmonies, the study of which is of the utmost importance to the singer, as well as the accompanist and composer. [See DIATONIC SCALE.]

Dr. Burney (in Rees' *Cyclopædia*) seems very much inclined to favour the opinions concerning accompaniment which Rousseau endeavoured to propagate in his *Lettre sur la Musique Française*. This acute French writer, the zealous defender of the Italian school when, as relates to dramatic music, it certainly was the best, thinks that an accompaniment of the smallest possible number of notes is to be preferred; and he appears to have been enraptured by a little boy who, at the performance of an Italian burletta in Paris, accompanied, on the harpsichord, the airs with harmony of the most meagre kind, sometimes playing with only two fingers. Rousseau had not acquired a taste for rich harmony, for with the music of the German school he was very little, if at all, acquainted; but that our celebrated and generally very judicious English writer, to whom the finest compositions of Germany were well known, should have sanctioned opinions formed upon the imperfect knowledge of the subject existing in the middle of the last century, is somewhat a matter of surprise; and as Dr. Burney is an authority, it is more necessary, for the sake of the art, to demur to his judgment here. *Est modus in rebus*—and sensible accompanists well know this medium. The old Italian accompaniment can now hardly be endured; while, certainly, many ultra-Germanists of the present day overpower melody by the multitude of notes which, for want of sound judgment, and in a true pedantic spirit, they are so prone to employ.

ACCOMPTS.—[See BOOK-KEEPING.]

ACCOUNT or **ACCOMPT** (from the low Latin *Computus*), is a form of action which in the earlier times was much resorted to, and of which frequent mention is made in the old law books. Strictly, it lay only against a bailiff or receiver, requiring him to render an account of the moneys received by him as such bailiff or receiver; but the form of action being found to be one of the most convenient at that time, it was extended to cases where the person called upon to account was neither a bailiff nor an authorized receiver, if he had in any way received and retained money which it was his duty to have handed over to the claimant. At present the action of account is rarely used, a bill in equity being found to be in practice a much more effectual mode of settling disputed accounts; whilst in the other cases formerly embraced by the action of account, various modern and more simple forms of proceeding are adopted in preference to this, which is difficult, dilatory, and expensive.

ACCUMULATION, in Political Economy, is the act of adding one *Saving* to another for the purpose of forming *Capital*. Every saving indicates an excess of production over consumption, and the accumulated excess constitutes individual and national riches.

In 1832, 14,311,647*l.* was the amount of deposits in Savings-Banks in England, Wales, and Ireland, made by 429,400 depositors. This large capital was an accumulation, penny by penny, shilling by shilling, and pound by pound, of the savings of that class of persons who, in every country, have the greatest difficulty in accumulating. Habitual efforts of self-denial, and a rigid determination to postpone temporary gratification to permanent good, could alone have enabled these accumulators to retain so much of what they had produced beyond the amount of what they consumed. This sum of 14,311,647*l.* represents as many products of industry as could be bought by that sum. It is a capital which remains for the encouragement of *productive* consumption; that is, it is now applied as a fund for setting others to produce,—to enable them to consume while they produce,—and in like manner to accumulate some part of their productions beyond what they consume. The whole amount of our national riches—the capital of this, and of every other country—has been formed by the same slow but certain process of individual savings, and the accumulations of savings.

The consumption of any production is the destruction of its value. The production was created by industry to administer to individual wants, to be consumed, to be destroyed. When a thing capable of being consumed is produced, a value is created; when it is consumed, that value is destroyed. The general mass of riches then remains the same as it was before that production took place. If the power to produce, and the disposition to consume, were equal and constant, there could be no saving, no accumulation, no capital. If mankind, by their intelligence, their skill, their division of employments, their union of forces, had not put themselves in a condition to produce more than is consumed while the great body of industrious undertakings is in progress, society would have been stationary,—civilization could never have advanced. Whatever is consumed by those who are carrying forward the business of production, is called *productive* consumption. Whatever, on the other hand, is consumed by those who are not engaged in re-producing, is called *unproductive* consumption.—1. A shoemaker, we will say, rents a shop, works up leather and other materials, uses various tools, burns out candles, and is himself fed and clothed while in the act of producing a pair of shoes. This is productive consumption;—for the pair of shoes represents the value of the materials employed in them, the commodities consumed by the shoemaker during their production, and the wear and tear of the tools applied in making them. If the shoes represent a higher value than what has been consumed, in consequence of the productiveness of the labour of the shoemaker, the difference is *net* produce, which may be saved, and with other savings, become capital.—2. The shoemaker, we will suppose, accumulates profits sufficient to enable him to live without making shoes, or applying himself to any other branch of industry. He now uses no materials, he employs no tools, but he consumes for the support and enjoyment of existence, without adding anything to the *gross* produce of society·—this is unproductive consumption. It would be well to note, however, that there may be direct production, and indirect production. The shoemaker is an example of the one case ;—the man of science, who enlarges the bounds of human knowledge, and thus enables others to produce more successfully, is an example of the other. [See CONSUMPTION.]

Accumulations merely hoarded up, and not put to use, have been denominated savings: when they are applied to the encouragement of production, they are capital, and are capable of producing profit. The savings of the artisans, domestics, and labourers, who make up the depositors in savings banks, are capital, and produce profit to the accumulators, in the shape of interest. If a man is engaged in manufactures or trade of any sort, his savings can be readily invested as capital; because every saving applied to his own branch of production enables him to extend the quantity of what he produces. If his savings exceed the demands of his business, he lends a portion of his capital, either directly or indirectly, to some other producer, who pays him a part of his profits as interest. Those who derive their income from revenue, and not from profit or labour, either consume as much as they receive, or they accumulate more capital. Whatever they save is—like every saving of every class—a clear addition to the general riches, and a means through which productive takes the place of unproductive consumption.

Whatever is saved and accumulated is a saving and accumulation of commodities which have been produced. The value of the accumulation is most conveniently expressed by an equivalent in money; but only a very small part of the accumulation is actually money. A few millions of bullion are sufficient to carry on the transactions of this country; its accumulations, or capital, could not be purchased by several times the amount of all the bullion that exists in the world. A great part of what is saved, therefore, is an accumulation of products suitable for consumption. The moment that they are applied to the encouragement of production, they begin to be consumed. They encourage production only as far as they enable the producers to consume while they are in the act of producing. Accumulation, therefore, is no hindrance to consumption. It encourages consumption as much as expenditure of revenue unaccompanied by accumulation. It changes only unproductive into productive consumption; it enables the things consumed to be replaced, instead of being utterly destroyed. The manner in which this effect is brought about requires to be shown a little in detail; and we may probably make the subject clearer if we exhibit the influence upon society of the conduct of three different individuals, each of whom may be taken as examples of a class.

1. The prodigal, who utterly destroys the accumulated property which the labours of others have created, is, fortunately, an exception to the general mass of consumers. As mankind have become more instructed, they have been less disposed to look with complacency upon the career of such an individual. Even amongst ill-informed people, it is not uncommon to hear it said of such an unhappy person, that he has eaten his estate. It is not, of course, meant by this expression that his house or his lands are actually consumed; but, though the house and lands remain, something equal in value has been destroyed by his extravagance. He mortgages or sells his house or lands; and the proceeds of the sale are consumed by riotous companions, by thoughtless domestics, by ministers to his sensual passions, by the persons who have been engaged in preparing for him foolish gratifications. The capital which has bought his house and lands has been withdrawn from productive consumption. It was employed, we will say, in a particular species of manufacture; and the workmen whom it called into action were accustomed to consume in the most advantageous way for production, whilst they were themselves reproducing. The capital is withdrawn from manufactures to support the consumption of a number of persons whose command of the means of consumption will soon be at an end; and whose consumption, while it lasts, is so capricious, that no regular branch of industry can address itself to its supply. The productive consumers, who were maintained while the capital was engaged in manufactures, lose their employment; they become competitors in the market of labour; their competition diminishes wages; and the whole body of productive consumers in their department of industry are compelled to consume less. The unproductive consumption of the prodigal goes on till he can consume no longer. The value of his estate is utterly destroyed; it is so much completely wasted of the general capital. If all capitalists were to pursue the same course as the prodigal, in less than a generation the most civilized country would return to a state of the most helpless barbarism. There would be no fund for the maintenance of labour. Adam Smith says of the man who encroaches upon his capital, 'By diminishing the funds destined for the employment of productive labour, he necessarily diminishes, so far as it depends upon him, the quantity of that labour which adds a value to the subject upon which it is bestowed, and, consequently, the value of the annual produce of the land and labour of the whole country, the real wealth and revenue of its inhabitants.'

2. The proprietor who systematically consumes his revenue, without taking from or adding to his capital, is not a public enemy, as the prodigal is, but he is certainly not a public benefactor. As far as the mere act of consumption goes he destroys without reproducing. But he may consume to the full extent of his income, furnishing no funds for reproductive consumption, without any fault of his own; and, in some respects, he may accumulate whilst he consumes, so as to enable others to consume profitably. If he have children whom he trains to manhood, bestowing upon them a liberal education, and causing them to be diligently instructed in some calling which requires skill and experience, he is an accumulator. By the capital thus spent in enabling his children to be producers, he has accumulated a fund out of his consumption which may be productive at a future day. He has postponed his contribution to the general stock; but he has not withheld it altogether. Speaking generally, however, of the class who consume all their income, we may be warranted in saying that the encouragement which they afford to industry never advances, because there is no accumulation to give employment to new industry. A man who receives a thousand a year, and spends it, may give employment to twenty men; but, after he has spent this sum for twenty years, he will, in the twentieth year, give employment only to the same number of men that he did in the first year. The fund which sets the labourers in action cannot increase, and therefore the labourers cannot increase, because the amount of labour to be performed cannot increase. If the labourers increase beyond the labour, they each labour less, and are each worse paid.

3. Let us take a capitalist with an income of a thousand a year, who consumes three-fifths of that income unproductively, and employs two-fifths in productive consumption. By his unproductive consumption of six hundred a year, twelve men are maintained, taking the proportion of the former case. By his productive consumption of four hundred a year, either in agricultural or commercial undertakings, or by lending the money to others, he employs eight men. The effect of the expenditure upon labour is so far equal in this case and the former. But when a profit is made, there is an essential difference; for if twelve and a half per cent., or fifty pounds profit, is annually made upon the four hundred pounds, there is a fund created for the constant employment of another labourer. The twelve and a half per cent. profit upon the profit, in five or six years, enables a second additional labourer to be employed, and so on. It is in this way that profits, gradually accumulated, enable the number of labourers to increase; and thus in all countries where capital is saved for productive consumption, the population may be doubled, and the larger number be yet better fed, and lodged, and clothed, than the smaller.

The accumulations of a nation, in its collective capacity, must be determined by the extent of individual accumulations. National accumulations facilitate individual, by rendering industry easier and more effective. They are exhibited in the form of roads, canals, harbours, docks, bridges, water-works, public buildings, endowments for education. These facilities for accumulation follow the accumulations of individuals, although a feeble accumulation may be rendered powerful by a judicious expenditure upon a great public object. The formation of a road, for instance, through an agricultural district, by opening a market, may enable the agriculturists to accumulate various savings arising out of that ready communication.

Whatever tends to enlighten the great body of the people facilitates individual accumulation. A large portion of the productions of industry, especially amongst the humbler classes of the community, is wasted, in addition to that portion which is enjoyed. Every consumption that is saved by habits of order, by knowing the best way of setting about a thing, by economy in the use of materials, is so much saved of the national capital; and what is saved remains to give new encouragement to the labour of the producer, and to bestow an increase of comforts upon the consumer. Again, the more that professional skill of every sort is based upon real knowledge, the more productive will be the industry of every class of labourers. Above all, sound morals, and pure and simple tastes, are the best preservatives from wasteful expenditure, both in the rich, and in the poor; and he that limits his individual gratification to objects worthy of a rational being, has the best chance of acquiring a sufficiency for his wants, and of laying by something to provide a fund for that productive consumption by which the wants of others are supplied. [See Smith's *Wealth of Nations*, Book ii. chap. iii. Say, *Cours Complet*, tom. i. chap. xiii. and xiv. M'Culloch's *Principles*, Part I. chap. ii. § 3. Mill's *Elements of Polit. Ecom.* chap. iv. § 1.]

ACCUSATIVE CASE, a term used in the grammatical system of the Latin language, and thence unnecessarily introduced into that of the English language. In Greek this case is not called *accusative*, but the same idea is expressed by a corresponding term in that language. In the article *ablative case*, the meaning of the word *case* was explained. In that article it was seen that the little syllable *em* is attached to the end of Latin nouns, and has the meaning of *motion to*. But where the simple Latin noun terminated in a vowel, the *e* of *em* was absorbed by that preceding vowel. Thus, to take an example, *Roma* was, and is, the name of the Roman capital, though, by Englishmen, generally corrupted into *Rome;* consequently, *to Rome* was expressed by *Romam* (a contraction from *Roma-em*)*;* so, *in Romam*, expressed *into Rome*. *In Roma*, without the *m*, would signify merely *in Rome*. The accusative then signifying, originally, the object to which any motion is directed, was afterwards, by a very natural metaphor, employed to distinguish the object of any action or feeling; thus, *incendere Romam, to burn Rome*. The Spanish and Portuguese have, in their languages, very closely imitated the Latin in this respect: *despidio de su casa à mi Dulcinea*—if translated word for word would be—he despatched from his house *to my Dulcinea;* but nothing more is meant than what we express by—he despatched my Dulcinea from his house. The *despatching* is with reference to Dulcinea. The employment of the letter *m*, with or without a weak vowel before it, occurs likewise in the Sanscrit language; and indeed in our own, in the pronouns *him* and *whom*, from *he* and *who*. The Greeks preferred the allied letter *n*, which is also found in some classes of the German nouns, as *den Grafen, the Count*, from the nominative *der Graf*. When the term *accusative case* is used in the grammar of our own language, it is only in this second or metaphorical sense, and, consequently, it is equivalent to what many grammars call by the better name of the *objective case*, or more simply the *object*.

ACER, a name given by the Romans to the tree called maple by the English. It is now applied to a genus of arborescent or shrubby plants, many of which are extremely valuable, for the sake either of their timber, or of their ornamental appearance. As they are for the most part hardy, we shall enumerate all the species that are known, giving characters to the most remarkable only. In order to assist the reader in distinguishing them, we have added figures, on a reduced scale, of the leaves of the more important kinds.

Acer is also the principal genus in the natural order called ACERINEÆ; which see.

GENERIC CHARACTER.

Flowers green and inconspicuous, either containing stamens only, or pistilla only, or both united, upon the same individual.

Calyx divided into five lobes, of uncertain length.

Stamens occasionally five; more frequently varying from seven to nine.

Leaves in all cases simple.

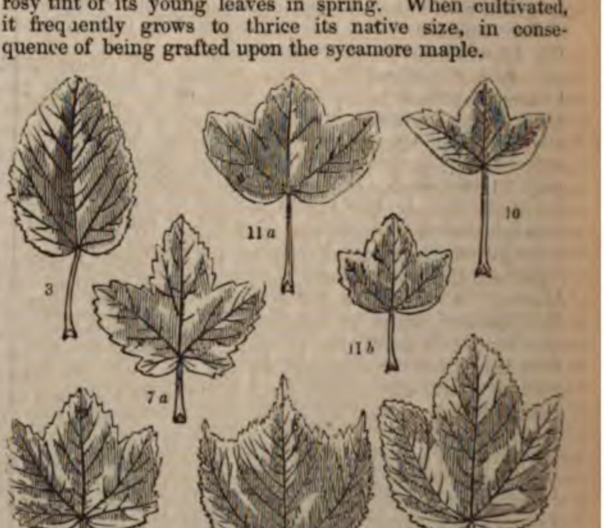
Fruit double; each division containing one single-seeded cavity, and extended at the back into a kind of wing; called *key* in English, or *samara* by botanists.

1. *Acer oblongum*, oval-leaved maple (*Wallich in De Cand. Prodr.* i. 593).—An evergreen tree, of rapid growth, native of the northern parts of India, both in Nepaul and Kumaon. It is probably confined to the hot valleys of those regions, for it has been found incapable of supporting the climate of England. Its leaves are six or seven inches long, without any divisions, of an ovate figure, tapering into a narrow point; they stand upon slender foot-stalks, and are smooth and glossy above; beneath they are covered with a slight bloom, and are finely netted. The keys are nearly parallel with each other.

2. *Acer lævigatum*, the polished maple (*Wallich, Pl. as. rar.* 2. 3. t. 104). Leaves oblong, taper-pointed, slightly serrated, shining, green beneath. Flowers white, in branched erect thyrses. Keys broad, short, smooth.—Found in the woods of the higher mountains of Nepaul, and also in the Alps of Sirmore, where it acquires a trunk thirty or forty feet high, and from three to four feet thick. Its growth is slow; its timber is said by Dr. Wallich to be used by the inhabitants of Nepaul for rafters, beams, and similar building purposes.

3. *Acer Tataricum*, the Tartarian maple (*Linn. Sp. pl.* 1495). Leaves heart-shaped, oblong, unequally serrated, usually undivided; the veins downy beneath. Flowers in short, erect, branched racemes. Keys diverging a little, rounded at the point.—An ornamental tree, or rather large bush, from fifteen to twenty feet high, often met with in gardens and plantations. Its native countries are the southern provinces of Russia in Asia, whence it extends as far as Hungary, there finding its most western limit. The Calmucs call it *zarza-modon*, or *locust-tree;* from its keys, deprived of their wings, they form, by the aid of boiling water, an astringent beverage, which, mixed with an abundance of milk and butter, forms a favourite article of their diet. The wood is hard and white, mixed with brownish veins.

4. *Acer striatum*, the striped-bark maple (*Lam. Dict.*, 2. 381. A. Pennsylvanicum, *Linn.* A. Canadense, *Du Ham*). Leaves roundish, finely serrated, divided at the upper end into three nearly equal tapering lobes; when young covered with a mealiness, which is gradually thrown off as they increase in size. Flowers in drooping racemes. Keys short, blunt, diverging. Bark striped with black and gray.—A native of North America, from Canada to the high lands in Georgia. In those countries it forms a considerable part of the undergrowth of the woods, among sugar-maples, beeches, birches, and hemlock-spruce firs. It rarely exceeds eight or ten feet in height, except in a few very favourable situations, when it will occasionally grow double that height. Its wood is very white, and is used by the North Americans for inlaying cabinet-work; its shoots afford food to various animals, especially to the moose-deer, in winter and spring, whence it has acquired the name of *moose-wood*. In Europe it is occasionally seen in plantations, where it is remarkable for the bright rosy tint of its young leaves in spring. When cultivated, it frequently grows to thrice its native size, in consequence of being grafted upon the sycamore maple.



3. A. tataricum. 11a and b. A. creticum.
10. A. monspessulanum. 7a. A. opulus. 8a. A. obtusatum.
4. A. striatum. 5. A. barbatum.

5. *Acer barbatum*, the bearded maple (*Mich. Fl. Am. bor.* 2. 252). Leaves heart-shaped, three-lobed, nearly equally serrated; the lobes of nearly equal size, or the lateral ones much the smallest; nearly smooth beneath. Clusters sessile; the stalks of the female flowers simple, of the male flowers branched. Calyx bearded internally. Keys smooth, diverging but little.—This rare and little-known species is a native, according to Pursh, of deep pine and cedar swamps in Jersey and Carolina, where it forms a small tree. Nothing is known of its useful application, if any. In the nurseries it is generally called A. trilobatum.

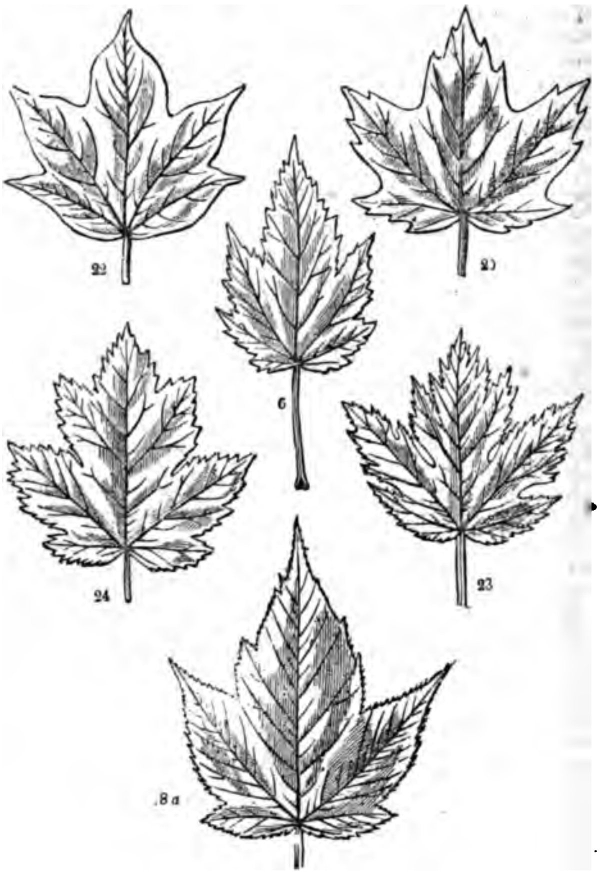
6. *Acer spicatum*, the spike-flowered maple (*Lam. Dict.*, 2. 381. A montanum, *Ait.*). Leaves heart-shaped, smooth above, downy and glaucous beneath, of an oblong figure, with about five unequal, tapering, coarsely and unequally serrated divisions. Flowers small, green, in upright racemes. Keys short, rounded, a little diverging.—A small tree, of rather inelegant appearance, found on mountains in the United States and in Canada. It is frequently seen in plantations in this country among other exotic trees. The red colour of its keys in the autumn forms its principal merit.

7. *Acer opulus*, the Gueldres-rose-leaved maple (*Ait. Hort. Kew*, 3. 436. A. rotundifolium, *Lam.* A. opulifolium, *Villars*). Leaves more or less heart-shaped, roundish, five-lobed, smooth beneath; the lobes generally obtuse, and coarsely serrated. Flowers in drooping corymbs. Keys smooth.—A small tree, ten or twelve feet high, found in France, especially in Dauphiny, where they call it *ayart*, and also in Spain. It is, in some respects, like *A. obtusatum*; but is readily known by its leaves being smooth beneath, and is far inferior to that noble species. It is not uncommon in botanical collections. Its leaves are sometimes very round, and sometimes have the lobes tapering; both are figured.

8. *Acer obtusatum*, the Neapolitan maple (*Willd. Sp. pl.* 4. 984. A. Neapolitanum, *Tenore*). Leaves heart-shaped, roundish, five-lobed, woolly beneath; the lobes either obtuse or pointed, and coarsely serrated. Flowers in drooping corymbs. Keys smooth.—Hungary, Croatia, and many parts of Italy, produce this beautiful species. On all the hills and lower mountains of the kingdom of Naples; in Camaldoni, Castellammare, and the Abruzzi, it is found abundantly, growing usually to the height of forty feet; it is extremely striking, with its reddish-purple branches in the wood of Lucania, between Rotonda and Rubia; and in the Basilicate and Calabria it is said, by Tenore, to acquire colossal dimensions. It is certainly very singular that so fine a tree as this, occupying so large a tract of country, frequently visited by English tourists, should be almost unknown in this country; and yet, although it is perfectly hardy, and very easily multiplied, it is scarcely ever met with in any but botanical collections. Two forms of the leaf are figured, one with blunt, and the other with pointed lobes.

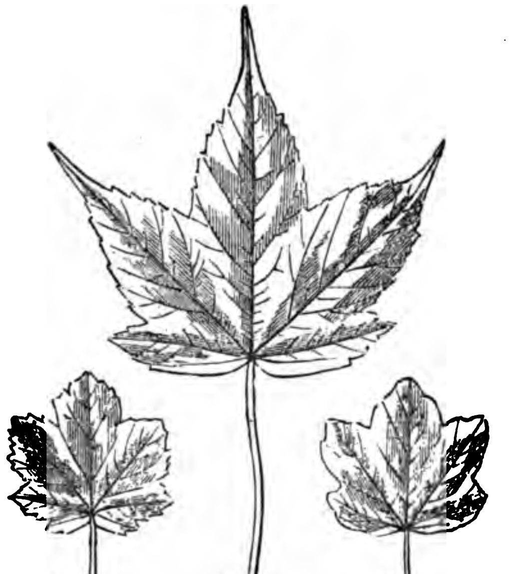
9. *Acer campestre*, the common maple. (*Linn. Sp. pl.* 1497.) Leaves heart-shaped, with three or five deep segments which are not serrated, but generally two or three-lobed, and narrow at their base; downy beneath, at least when young. Branches covered when old with a corky bark. Flowers in erect, branched, downy corymbs. Keys short, smooth, with nearly parallel edges, diverging at right angles.—Such appears to be the most general character of this very common species, found in every hedge-row in England, and spread over the greater part of Europe. It is said not to be indigenous in Scotland, and on the Continent it does not approach the north nearer than the southern provinces of Sweden. It advances as far to the eastward as the range of the Caucasus, where it disappears. In England this is either a bush or a small tree, of inelegant appearance, and its wood is of little value, except for the use of the turner, who makes it into cups, bowls, &c.; in the southern region of Caucasus, we are told by Pallas that it becomes a tree of handsome aspect, with a trunk as thick as a man's body, and that its wood is so hard as to be in request for the manufacture of musket-stocks: it must, however, be remarked, that this writer states the keys of his plant to be covered with down; it is, therefore, to be suspected that the Caucasian plant is distinct from our maple, in which the keys are always smooth. It is much to be wished that this point, which is of some importance, were cleared up. The common maple is sometimes planted by farmers upon bad land, for the purpose of fencing, for which, however, it is ill adapted.

There is a supposed variety of this, called *Acer austriacum*, found in the woods of Hungary and Austria, which has the segments of the leaves always broadest at the base, and scarcely lobed.



22. A. Lobelii. 20. A. saccharinum. 24. A. rubrum.
23. A. eriocarpon. 18a. A. caudatum. 6. A. spicatum.

10. *Acer Monspessulanum*, the Montpellier maple (*Linn. Sp. pl.* 1497. A. trilobatum, *Lam.* A. trilobum, *Mönch*). Leaves deciduous, very slightly cordate, and downy at the base, with three perfectly entire, nearly equal, diverging lobes, slightly hairy beneath. Flowers in small, loose, erect bunches, on long capillary stalks. Keys short, smooth, but little diverging.—Found in dry, stony situations in Languedoc, Dauphiny, Provence, and Piedmont; it even occurs as



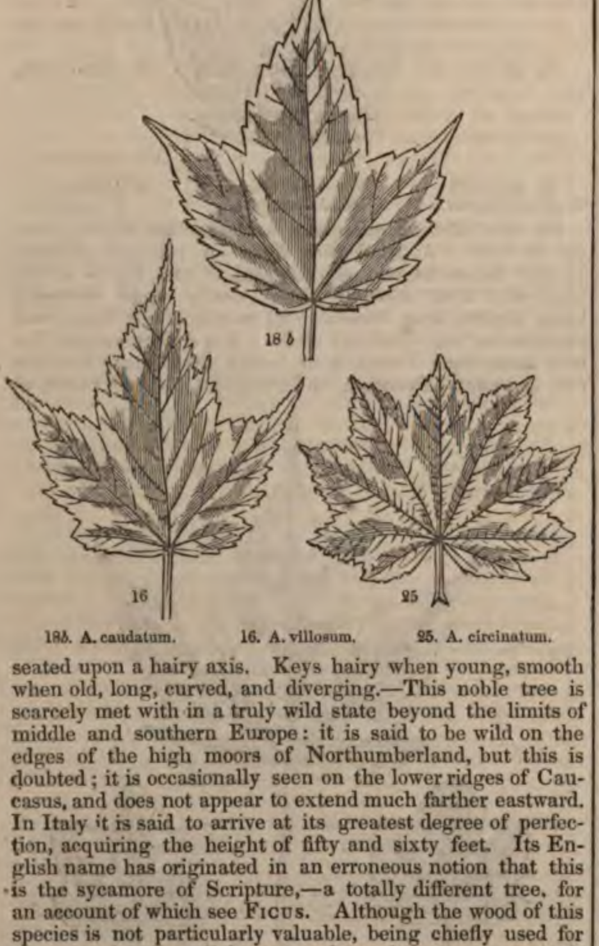
7b. A. opulus. 15. A. sterculiaceum. 8b. A. obtusatum.

far north as the departments of the Rhine. A small tree of rather handsome appearance, not uncommon in our shrubberies. It has in some respects the appearance of *A. campestre.* The little tuft of hair on the leaves at the point whence the principal veins radiate, is a good characteristic mark.

11. *Acer creticum,* the Candian maple. (*Linn. Sp. pl.* 1497. A. coriaceum, *Hort.*). Leaves evergreen, variable in form, wedge-shaped at the base, leathery, glossy, smooth, with three entire or serrated lobes, of which the side ones are the shortest, sometimes undivided. Flowers in small, erect clusters. Keys small, broad, but little diverging.—A very handsome evergreen shrub, or small tree, said to grow twenty feet high, found on the mountains of Candia and the Grecian archipelago; it is frequently cultivated in the South of Europe, but is apparently unknown in this country, being probably too tender to bear our winters. The plant usually called *A. creticum* in this country is *A. heterophyllum.*

12. *Acer heterophyllum,* the variable maple (*Willd. Arb.* 10. t. 1. f. 1). Leaves evergreen, ovate, unequally-serrated, entire or occasionally three-lobed, very glossy.—This is the plant sold in the English nurseries under the name of *A. creticum.* It is rather delicate, and is seldom met with in this country more than seven or eight feet high, when it becomes a scrubby bush, having little to recommend it except its rarity. No one has described either its flowers or fruit. It is a native of the Levant.

13. *Acer pseudo-platanus,* the sycamore maple (*Linn. Sp. pl.* 1496.) Leaves heart-shaped, coarsely and unequally serrated, glaucous and downy on the veins beneath; with five lobes, of which the lower ones are generally the smallest. Flowers in short, pendulous, slightly divided racemes, seated upon a hairy axis. Keys hairy when young, smooth when old, long, curved, and diverging.—This noble tree is scarcely met with in a truly wild state beyond the limits of middle and southern Europe: it is said to be wild on the edges of the high moors of Northumberland, but this is doubted; it is occasionally seen on the lower ridges of Caucasus, and does not appear to extend much farther eastward. In Italy it is said to arrive at its greatest degree of perfection, acquiring the height of fifty and sixty feet. Its English name has originated in an erroneous notion that this is the sycamore of Scripture,—a totally different tree, for an account of which see Ficus. Although the wood of this species is not particularly valuable, being chiefly used for coarse work, where lightness and toughness are required, yet there is scarcely any more universally cultivated for the sake of the striking effect it produces, whether as a single tree, or planted in avenues, or in masses. It thrives upon poor, sandy, or gravelly soil, especially near the sea, where few other trees will succeed; and will even bear the *smoke* of London, although not so well as some others, Many varieties are known to gardeners, of which the following are the most deserving notice.—



18b. A. caudatum. 16. A. villosum. 25. A. circinatum.

i. *The Red or Gold-striped.*—Leaves stained with yellow and red.

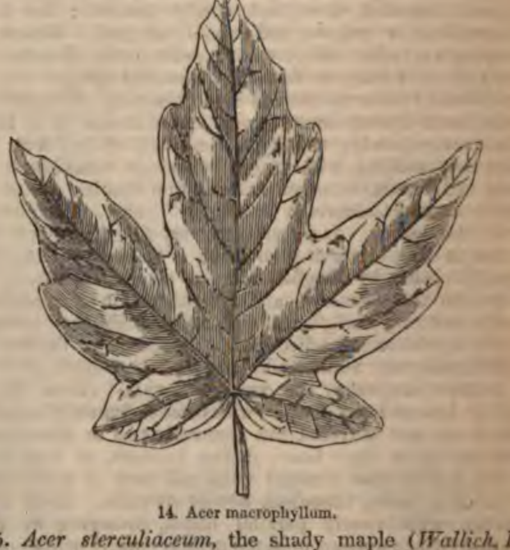
ii. *The Silver-striped.*—Leaves marked with streaks of white.

iii. *The Golden.*—Leaves having altogether a yellow tint.

iv. *The Corstorphine Plane.*—Distinguished by its broad leaves, and more vigorous mode of growth.

There is also found in the woods of Hungary, near Szánto, what botanists consider a variety, with the lower lobes of the leaves as large as the upper. By some this is called *A. palmifolium.*

14. *Acer macrophyllum,* the broad-leaved maple (*Pursh, Fl. Am. Bor.* 267). Leaves deeply heart-shaped, not serrated, divided into five deep, spreading, slightly-lobed segments, the middle one of which is often narrow at its base, and the lower ones generally smaller than the others; when young slightly downy, when old shining and perfectly smooth. Flowers in drooping very compact racemes, large, pale, yellowish green. Keys long, straight, diverging, covered at the base with long stiff hairs.—This species, which is probably the finest of the genus, has recently been procured in a living state, by the Horticultural Society, from the north-west coast of North America, where it forms a very large tree, having a dense umbrageous head, and yielding a timber apparently of considerable value; specimens of it, brought from North America, are scarcely inferior in beauty of the grain to the finest satin-wood. It proves to be a hardy tree, of very rapid growth, sometimes making shoots six or seven feet long in a season; and is remarkable for the unusual size of its leaves, some of which, on young vigorous shoots, have measured as much as ten inches in diameter.



14. Acer macrophyllum.

15. *Acer sterculiaceum,* the shady maple (*Wallich, Pl. as. rar.* 2. 3. t. 105). Leaves heart-shaped, downy on the under side, with five ovate, taper-pointed, serrated lobes, of which the lowest are very small. Flowers in very short drooping racemes.—A large tree, with a trunk often three feet in diameter; found in Nepaul, upon Mount Sheopore. It is not yet in England.

16. *Acer villosum,* the shaggy maple (*Wallich, Pl. as. rar.* 2. 4). Leaves heart-shaped, three-lobed, occasionally with two very obscure lateral lobes near the base, shaggy beneath; the lobes ovate, taper-pointed, remotely but equally serrated. Flowers in copious, nodding, shaggy, branched clusters. Keys downy.—A very large tree, found on the high Alps of India, approaching the limits of perpetual snow in Sirmore and Kumaon. This very distinct species is one of the finest trees in the north of India. It would, no doubt, prove hardy in this country, and it is much to be wished that it could be procured.

17. *Acer cultratum,* the curve-keyed maple (*Wallich, Pl. as. rar.* 2. 4).—A large tree, native of the regions towards the Himalaya, in Kamaon and Srinaghur.

18. *Acer caudatum,* the long-pointed maple (*Wallich, Pl. as. rar.* 2. 4.)—Native of the highest regions of Nepaul, towards Gossain Than, of Sirmore, Kumaon, and Srinaghur,

19. *Acer Platanoides*, the Norway maple (*Linn. Sp. pl.* 1496). Leaves heart-shaped, very smooth, except at the axillæ of the veins; five-lobed, the lobes taper-pointed and diverging, with a few taper-pointed diverging teeth. Flowers in loose, erect, stalked corymbs. Keys smooth, diverging.—A fine tree, with very handsome glossy deep-green leaves, for the sake of which it is a great deal cultivated. The northern and midland parts of Europe, and the north of Asia, as far as the Ural chain, produce this species. In the Russian empire it passes from the state of a shrub, in the northern provinces, to that of a handsome tree with a trunk two feet thick, in the more southern districts. Its wood is valued for turners' work; from its ascending sap a kind of coarse sugar has been procured, in the same way as from the *A. saccharinum*, in America. Two varieties are known to gardeners; one, *the silver-striped*, in which the leaves are slightly stained with white; and the other, the *cut-leaved*, in which the leaves are deeply and irregularly jagged. When the foot-stalks of the leaves are broken they exude a milky fluid.

20. *Acer saccharinum*, the sugar maple (*Linn. Sp. pl.* 1496). Leaves heart-shaped, glaucous beneath, very smooth, except at the axillæ of the veins; five-lobed, the lobes taper-pointed, and very coarsely toothed. Flowers in nodding corymbs. Keys not much diverging.—From a little to the north of Saint Jean, in Canada, to the woods of Upper Virginia, and probably still farther South, this species prevails; and it forms a large portion of the vegetation of New Brunswick, Nova Scotia, Vermont, and New Hampshire, sometimes becoming as much as eighty feet high. In the autumn the woods of those countries are dyed of a crimson hue, by the changing leaves of the sugar maple. The wood is hard, and has a satiny lustre, but it is readily attacked by insects, and is not of much value, except when its grain is accidentally waved, and then it is in request for the cabinet-makers. The younger Michaux states, that it may be at all times known from that of the red maple by a very simple test. If you pour a drop or two of solution of sulphate of iron upon the wood of the sugar maple, in a minute it becomes of a greenish cast, while that of the red maple becomes deep blue. The saccharine matter contained in its ascending sap is the principal cause of this species being in so much request. From this, obtained by tapping the trunk in the spring, during the space of six weeks, a very considerable quantity of a fine brown sugar is procured; as much, it is said, as 33 lb. per tree. The sugar maple does not generally succeed very well in England, where it is rarely seen; and even when in health is not more than fifteen or sixteen feet high.

21. *Acer nigrum*, the black sugar maple (*Michaux*, *Arb.* ii. p. 238, t. 16).—This plant is a native of similar situations with the last, of which perhaps it is only a variety. It differs, however, in having leaves of a deeper green, whence its name *black*, with their base much more heart-shaped, and much more downy beneath. It appears to possess the properties of the sugar maple, but in a very inferior degree.

22. *Acer Lobelii*, Lobel's maple (*Tenore Corso Botanico*, iv. 174). Leaves very slightly heart-shaped, imperfectly and irregularly toothed, divided into five shallow, abruptly-pointed lobes; quite smooth beneath, except at the point, whence the principal veins radiate. Keys smooth, very much diverging.—This is a large tree, in some respects not unlike A. Platanoides, with a perpendicular trunk, and a handsome pyramidal head. It is found among the mountains in the north of the kingdom of Naples; at Avvocata near Monte Vergine, Cerealto, Monte S. Angelo di Castellammare, &c.

23. *Acer eriocarpon*, Sir Charles Wager's maple (*Michaux*, *Fl. Am. sept.* ii. 253. A. dasycarpum, *Willd*). Leaves truncated at the base, glaucous and smooth beneath, deeply divided into five jagged, taper-pointed lobes. Flowers in thick clusters, without any petals. Keys large, green.—Found in most parts of North America on the eastern side, where it is commonly called *white maple*. It grows with great rapidity, especially on the banks of clear rivulets with a gravelly bottom, and is perhaps one of the most ornamental of the genus. It is extremely common in the plantations of all Europe, where it is remarkable for the deep crimson hue of its leaves in autumn. Its wood is light, and of little or no value except to the turner. It is said to make excellent charcoal for gunpowder. The height of this species often bears so little proportion to its other dimensions, that, according to the testimony of the younger Michaux, trees are found, especially at the mouth of the rivers Mononghahela and Alleghany, as much as fifteen feet in circumference of their trunk, without corresponding height. The nurserymen usually call this species the *cut-leaved scarlet maple*.

24. *Acer rubrum*, the scarlet maple (*Linn. Sp. pl.* 1496. A. coccineum, *Hort.*). Leaves slightly heart-shaped, glaucous beneath, divided into about three coarsely-toothed and lobed segments. Flowers clustered, with petals. Keys small, red.—The deep-red colour of the flowers in the spring, and of the keys and leaves in autumn, have given rise to the name of this species, which is found, from Canada to Florida, growing in swamps along with alders. With us it is one of the first trees that put forth their blossoms in the spring; and it is delightful to see its slender branches teeming with rosy life in the beginning of March, when almost all Nature is elsewhere still. Its wood is far more valuable than that of the *Acer eriocarpon*; it is not only constantly used by the Americans for articles of furniture, but is also in request for the stocks of rifles,—for which, when it is what they call *curled*, its toughness renders it well adapted. Two varieties of this species are cultivated in this country, under the names of *A. coccineum* and *A. intermedium*.

25. *Acer circinatum*, the curled maple (*Pursh*, *Fl. Am. sept.* i. 267). Leaves deeply cordate, roundish, divided into seven shallow, sharp-pointed, serrated lobes. Flowers in few-flowered corymbs.—On the north-west coast of North America this grows in company with A. macrophyllum. It is a small, scrubby, worthless tree. Specimens of it are growing in the garden of the Horticultural Society of London.

Besides the foregoing, the following are mentioned by botanical writers, but little is known of them.

26. *A. hybridum* (Bosc, Dict. Agr. 5.251). Origin unknown: cultivated in France.?

27. *A. obtusifolium* (Fl. Græca, t. 361). Found on the Sphaciote mountains of Greece.

28. *A. ibericum* (Bieb. Fl. Taur. Cauc.). A small tree, like A. monspessulanum: found in Iberia.

29. *A. dissectum* (Thunb. Jap. 160.)	All natives of Japan.
30. *A. Japonicum* (Ib. p. 161.)	
31. *A. palmatum* (Ib. l. c.)	
32. *A. septemlobum* (Ib. p. 162.)	
33. *A. pictum* (Ib. p. 162.)	
34. *A. trifidum* (Ib. p. 163.)	

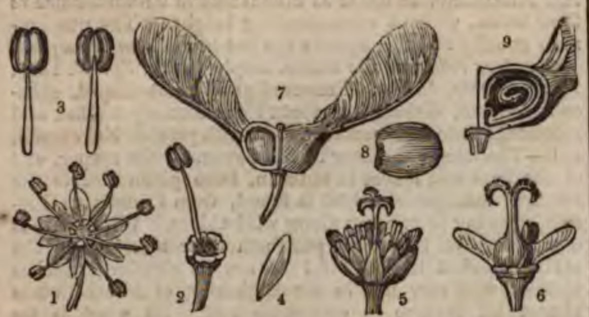
For A. Negundo, see NEGUNDO.

Cultivation.—The hardy maples, which are the only kinds of any importance in this country, are all increased either by seeds or layers. The European species readily yield their *keys*, which should be gathered when fully ripe, and immediately buried in heaps of river sand, where they may remain till the following February; they may then be sown in beds, rather thinly, and, when one year old, should be transplanted and treated like other forest trees. They ought never to be headed back, as oaks and Spanish chestnuts are. From layers they all make excellent plants very rapidly. They are occasionally budded upon the common sycamore, but this mode is little practised in England.

ACERINEÆ, a tribe of plants comprehending only the maples (see ACER) and the ash-leaved maples (see NEGUNDO). They belong to the Polypetalous division of the Dicotyledonous class, and are related to *Tiliaceæ*, or the Linden tribe: they are also akin to a tribe of tropical plants called *Malpighiaceæ*, which see. They are known—1. by their flowers being what is called unsymmetrical, that is, not having the various parts agreeing in number: for instance, while the calyx and corolla are divided each into five parts, there are seven, eight, or nine stamens, and three divisions of the pistillum—2. by their stamens being hypogynous, and inserted upon a disk—3. by their winged fruit, or *keys*—and, 4. by their petals having no appendages upon them. The species are all trees or shrubs, with opposite stalked exstipulate leaves, and are found exclusively in the north of Europe, Asia, America, and India. A sweet, mucilaginous sap is common in these plants, from which sugar can be manufactured.

CHARACTER.

Flowers either unisexual (1) or bisexual (5). Calyx and corolla (1) equal in the number of their parts, with an imbricated æstivation; the corolla sometimes absent. Petals (4) without appendages; stamens (3) hypogynous, inserted upon a disk (2.6), which arises from below the pistillum, not agreeing in number with the divisions of the calyx and corolla. Pistillum (6) two-lobed, each lobe having a wing at its back. Style one. Stigmata two. Fruit (7) formed of two samaræ, or keys, with long wings at their back, each containing one cell and one erect seed (8). Embryo (9) curved, with leafy, shrivelled cotyledons, and no albumen. Trees or shrubs, with opposite leaves, without stipulæ.



ACE'TATE, a salt resulting from the combination of the acetic acid with an alkaline, earthy, metallic, or vegeto-alkaline base. The acetates are prepared in different modes, according to circumstances; and indeed the same acetate may frequently be made by various processes. The acetate of soda, which is an alkaline acetate, may be formed, though not advantageously, by single affinity, or saturating the acid with the caustic soda: the acetate of lime, an earthy acetate, is easily procured by single elective affinity and decomposition, as when carbonate of lime (chalk) is added to the acid as long as it will dissolve; and the acetate of zinc, which is a metallic acetate, may be obtained by mixing a solution of acetate of lead with one of sulphate of zinc: in this case acetate of zinc is produced by double elective affinity and decomposition. All acetates, and indeed all salts whatever, are the result either of single, single elective, or double elective affinity.

It follows, from what has been stated, that the acetates may be divided into four classes,—namely, the alkaline, earthy, metallic, and vegeto-alkaline acetates; as an example of each, and in the order mentioned, the following may be enumerated:—acetate of soda, lime, lead, and morphia.

Although the classes of acetates possess some properties in common, yet, from the very different nature of their bases, it can hardly be expected that the points of agreement should be numerous. Thus, the acetate of ammonia is evaporable by heat, whilst the other alkaline acetates are not merely decomposed at a high temperature, but the acid itself undergoes this change, and its carbon and oxygen, or a portion of them, recombine so as to form carbonic acid; and some acetates, that of soda for example, are converted by heat into carbonates. Many of the earthy acetates suffer similar changes; thus, the acetate of lime is reduced by heat to a carbonate, but if the heat be long continued, and stronger than required for the formation of the carbonic acid, the carbonic acid is subsequently expelled, and pure lime remains instead of the carbonate.

Some of the metallic acetates, when subjected to distillation at a high temperature, yield a large portion of acetic acid of considerable purity. This is the case with the acetate of silver, and also with that of copper, after it has been redistilled. But there are other metallic acetates—as the acetate of lead and of zinc—which, besides acetic acid, furnish a peculiar volatile inflammable fluid called pyro-acetic spirit: this is derived from the decomposition of a part of the acetic acid, and the recombination of its elements in different proportions. In general those acetates which are easily decomposed give most acetic acid and least pyro-acetic spirit, and *vice versâ*.

In the retort in which the metallic acetates are decomposed by heat during distillation, their bases, in some instances, remain in the metallic state. This happens with the acetates of copper, lead, and silver; while the acetates of iron, manganese, and zinc leave the bases in the form of oxide: in both cases the residue is mixed with charcoal, which results from the decomposition of a portion of the acetic acid; and, derived from the same source, there are evolved carbonic acid gas, and carburetted hydrogen gas.

The vegeto-alkaline acetates, such as those of morphia, quina, &c., are decomposed and totally dissipated when exposed to heat in open vessels. As the affinity existing between the acetic acid and the bases with which it combines is but weak, all acetates are decomposed by the more powerful acids. On this circumstance depends the preparation of acetic acid from some acetates, especially those of soda and lime, by the action of sulphuric acid (oil of vitriol). This stronger acid unites with the bases, and expels the acetic acid, which is condensed in proper receivers.

Although most acetates are artificial products, yet the acetate of potash exists in the sap of some plants. The acetates are, with few exceptions, readily soluble in water, and many of them are easily crystallized: they are a very important class of compounds; some of them, as already noticed, are used in the preparation of acetic acid. The acetate of alumina and the acetate of iron are largely employed by calico-printers; and many of the metallic acetates are used also by them, and by dyers and colour-makers.

ACETIC ACID. This acid, sometimes called also acetous acid, is the sour part of vinegar, and that to which its peculiar and valuable properties are owing. Vinegar, in whatever way made, is, in fact, dilute acetic acid, mixed with colouring matter, and some slight impurities. Acetic acid, as will presently be more particularly mentioned, is a compound of the elements oxygen, hydrogen, and carbon; these bodies, however, cannot be made to combine by direct chemical action, but must be separated from previous combination, either by the agency of fermentation or the action of heat, and they then re-combine to form the acid in question.

The acetic acid exists in the juice of some plants, as will be shown when the chemistry of vegetable substances is treated of; at present it is to be considered as procured,—*first*, by the fermentation of saccharine or sugary matter,—*secondly*, by the action of heat upon wood; the product of the former constituting vinegar, and of the latter, what was formerly called pyroligneous acid, but which is now largely employed, when purified, for most of the purposes to which vinegar is applied.

It is well known that, when certain vegetable juices which contain much sugar, such as that of the grape, are fermented, the first operation, if the heat be not too great, is that of causing the decomposition of the sugar, and the recombination of its elements, so as to form carbonic acid, or fixed air, most of which escapes in the state of gas; and alcohol, or spirit of wine, the greater part of which remains with the fermented juice: this is called the *vinous* fermentation, the product being wine. Now sugar is a compound of three elements, which also form spirit of wine or alcohol,—viz. oxygen, carbon, and hydrogen; and while a portion of the two former unite to yield the carbonic acid, a part of the three combine to form alcohol or spirit of wine.

When the fermentation proceeds farther, as it is apt to do with very weak wines, if exposed to air, and a higher temperature than that at which they were produced, a new arrangement of the oxygen, hydrogen, and carbon, which form the alcohol or spirit, again takes place, and it is converted by this into vinegar, or, in other words, the acetous fermentation is produced. There can be scarcely a doubt that vinegar, as its name implies, was first procured, and most probably by accident, from the passage of the vinous into the acetous fermentation; and, in fact, it is now usually prepared in wine countries, by exposing the wine in casks to the action of the air, at a temperature of about 76° of Fahrenheit's thermometer.

In this country vinegar is procured from an infusion of malt, termed *wort*, which is fermented in the usual way. It is then put into barrels, which are arranged in stoves, with their bungs out, and kept in a temperature of about 84° of Fahrenheit's thermometer. At this heat, which is considerably higher than that required for the vinous fermentation, carbonic acid is produced, which escapes as in the vinous fermentation; while a part of the oxygen, hydrogen, and carbon of the sugar of the malt unite to form vinegar, or acetic acid.

Vinegar thus procured is a well-known reddish brown-coloured liquid; its smell is rather pleasant and refreshing, and its taste is distinctly, but not intensely sour. The strongest malt vinegar is termed by the maker No. 24, and is calculated to contain 5 per cent. of real acetic acid; the manufacturer is allowed to mix with it one-thousandth part of its weight of sulphuric acid (oil of vitriol): vinegar, therefore, is not pure acetic acid, but is a mixture of a small portion of the acid, much water, a little sulphuric acid, spirit of wine, colouring matter, and mucilage.

Vinegar possesses the usual power of acids to redden vegetable blue colours; it combines with the alkalis, earths and metallic oxides to form salts, which are termed acetates, some of which are of considerable importance, being largely used both in the arts and medicine.

Vinegar is purified from the sulphuric acid and colouring matter by distillation, but its smell and taste are then less agreeable: and although it is colourless, it cannot be conveniently or economically employed for the chemical purposes to which purer and stronger acetic acid is applied; not only on account of its weakness, but because the mucilage, which rises with it in distillation, renders the salts formed with it extremely difficult to purify. When vinegar is exposed to a low temperature, it is principally the watery part which freezes; and, although the fluid portion is thus rendered stronger, it is unfit, on account of the presence of the colouring matter and sulphuric acid, for use as acetic acid.

The *second* method of obtaining acetic acid is by heating wood, as the dried branches of trees, in hollow iron cylinders, with a proper arrangement of coolers or condensers and receivers.

The acid thus procured, is called pyroligneous acid, and was at first supposed not to contain the acetic but a peculiar acid, different from all others. It is of a dark brown colour, has a strong burnt acid smell, is very sour to the taste, and acts strongly on vegetable blue colours. It contains a quantity of tar and oily matter; from these it is purified, in a considerable degree, by redistillation, but it is still very impure. It is then to be mixed with chalk or with lime; and when saturated, so as to be converted into acetate of lime, the solution is evaporated to dryness, and then it is what is termed pyrolignite of lime; but it is, in fact, an impure acetate of that earth.

In order to render the acetic acid sufficiently pure, or rather to obtain an acetate fit for that purpose, the pyrolignite of lime is dissolved in water, and there is added to it a sufficient quantity of sulphate of soda (Glauber's salt) also dissolved. Owing to the greater affinity existing between the sulphuric acid contained in the sulphate of soda, and the lime contained in the acetate or pyrolignite, they combine; and the sulphate of lime formed being very sparingly dissolved by the water, it is precipitated in the state of a bulky powder: the soda of the sulphate then unites with the acetic acid of the acetate of lime, and the salt which they form is acetate of soda. This is readily dissolved by the water, and by proper evaporation crystals are obtained, which, by re-dissolving in water and again crystallizing, may be rendered much purer. But if the salt should be still impure, it must be heated pretty strongly in an iron vessel. If the operation be carefully conducted, the impurity only of the acetate of soda is decomposed by the action of the heat; it is then to be again dissolved in water and crystallized, and the crystals, after being once more pretty strongly heated to deprive them of their water, give an acetate of soda fit for use, and yielding pure acetic acid in a mode which we shall now describe.

Reduce seventeen parts of dried acetate of soda to coarse powder, and put it into a glass retort; upon this pour gradually ten parts of sulphuric acid, and subject the mixture to slow distillation in a sand heat. By the mutual action of these substances, the sulphuric acid, on account of the greater affinity existing between it and the soda of the acetate, than between the soda and the acetic acid, combines with the former and releases the latter, which comes over in the form of vapour, and is to be condensed in a glass receiver. In the retort there remains sulphate of soda, which is to be dissolved out and retained for a future operation, with pyrolignite of lime.

The acetic acid thus procured has the following properties: it is fluid and colourless, its smell is exceedingly pungent, and its taste very acrid and sour; if applied to the skin it occasions smarting, and even raises blisters upon it. When heated, the vapour which rises from it takes fire if a lighted taper is exposed to it. At about 45° of Fahr. a portion of this acid becomes solid and shoots into beautiful crystals; these contain no sulphurous acid, even though the product should not have been re-distilled; but a portion of sulphurous acid, formed during distillation, by the decomposition of a part of the sulphuric acid, remains with the uncrystallized acid, from which it may be separated by mixing it with a small quantity of deutoxide of lead (red lead) and re-distillation. The crystals of acetic acid melt at a little below 60° of Fahr.; and the specific gravity of the solution at 60° Fahr., is 1.06296, water being 1. This crystallized acetic acid is sometimes called radical vinegar and glacial acetic acid.

Acetic acid cannot exist except in combination with water, or a base, as the alkali soda, and when in the latter state of combination, and quite dry, it consists of

three	equivalents or	atoms of	oxygen	$8 \times 3 = 24$
three	do.	do.	hydrogen	$1 \times 3 = 3$
four	do.	do	carbon	$6 \times 4 = 24$
			Equivalent or atomic weight	51

The crystals or glacial acetic acid above described consist of

one	equivalent or	atom of	acetic acid	51
one	do.	do.	water	9
			Equivalent or atomic weight	60

Acetic acid may also be obtained by the mere action of heat upon the binacetate of copper, or, as it is sometimes called, though improperly, *distilled verdigris*. The acetate of copper is first to be dried, so as to expel the greater part of the water of crystallization, and then subjected to a pretty strong heat, in an earthen or glass retort, to which a receiver is to be properly adapted. The heat decomposes the salt, and the copper remains in the retort in the state of black or peroxide. The acid when first procured has a greenish tint, owing to the admixture of some peroxide of copper; it must be rendered free from this by redistillation. This acid, though not quite so strong as that procured by the former process, is, however, still more concentrated than that required for general use. The following is a good process for obtaining acetic acid, of sufficient strength for most purposes:—

Put into a glass retort 12 ounces of dry crystals of acetate of soda, and pour upon it 4½ ounces of sulphuric acid, previously mixed with an equal weight of water; when the receiver is adapted, distil, either by the heat of an Argand's lamp, or of a sand heat; about 14 ounces of acetic acid of specific gravity, 1.046 will be obtained, containing nearly 30 per cent. of *real* acetic acid.

The uses to which acetic acid, in the state of vinegar, is applied are too well known to require notice; in the form of pyroligneous acid it is employed to preserve meat, and to impart to it the smoky flavour usually obtained by drying. Pure acetic acid is used in chemical researches, and especially for preparing various acetates. In a less pure state it is employed in the arts for preparing acetate or sugar of lead, acetate of copper or verdigris, and acetate of alumina, largely used by calico printers as a mordant.

ACHÆ'A, one of the ancient great divisions of the Peloponnesus, now the Morea, extending from the river Larissus, near Cape Araxus, along the coast of the Corinthian Bay (Gulf of Lepanto), as far east as the small territory of Sicyon, which separated it from that of Corinth. The Sythas, a petty stream, separated Achæa from Sicyonia. The greatest length, in a straight line between the western and eastern boundaries, is about sixty-five English miles. The breadth of the province varies irregularly from about twelve to twenty miles. Being, for the most part, only a narrow slip between the Arcadian mountains and the sea, the courses of the numerous streams that flow into the Corinthian Gulf are short; and many of them are quite dry in summer.

This province contains many defiles and mountain passes formed by branches of the great Arcadian ridge, which, in some parts, run down to the Corinthian Gulf. The coast is generally low, and has few good ports.

Before this country was occupied by the Achæi, it was called Ægialos, afterwards Ionia, and sometimes Ægialeian Ionia, which probably means no more than 'Ionia on the sea-coast:' it then contained twelve cities or states. The same number of political divisions subsisted under the Achæi in the time of Herodotus, and retained their names under Roman dominion; at present Patræ, now Patras, situated on the coast, about six miles from the entrance of the gulf of Corinth, is the only Achæan town that maintains any importance. The very sites of some of them are, at least, doubtful or unknown. Vostitza is probably the ancient Ægium, where the states of Achæa used to meet. Helice, on the coast, was destroyed by an earthquake, accompanied by an irruption of the sea, B.C. 373. [*Pausanias*, b. 7. chap. 24.] Bura, at the same time, was so violently shaken, that the old statues in the temples were destroyed, and only those persons escaped who happened to be absent from the town. Their descendants were the people who formed one of the members of the subsequent Achæan confederation.

After the Roman conquest of Greece, the term Achæa received an extension in its signification, principally due to the importance which the Achæan league had obtained. The Roman province of Achæa comprehended all Peloponnesus with northern Greece south of Thessaly, perhaps not including Acarnania. But it is exceedingly difficult to fix the precise limits of the Roman provinces of Macedonia and Achæa. Nicopolis, a town which Augustus built near the *northern* entrance of the Ambraciot Gulf (Gulf of Arta) to commemorate his victory at Actium, is included in the province of Achæa, in a passage of Tacitus. (*Annals*, II. 53.) The towns generally preserved their own internal administration, except that the municipal power was put into the hands of the richer citizens.

Achæa was also an early name of the south-eastern portion of Thessaly. [See ACHÆI.]

ACHÆ'I. The Achæi are first mentioned by Homer, as the ruling people of the eastern and south-eastern part of the Peloponnesus. Among the chief cities in their dominions were Argos, Sparta, Mycenæ (the capital of Agamemnon,) Corinth, Sicyon, and the island of Ægina. Among the followers of Achilles to the war of Troy, Achæi are mentioned as well as Hellenes; the latter name, in course of time, prevailed so far as to become the characteristic name of all that people whom we call Greek. From comparing Homer with Strabo and Pausanias, we infer that the Achæi came from Thessaly, and that, at the time of the war of Troy, according to Homer's notion, they were the ruling nation in a large part of the Peloponnesus, and the chief people in the war against Troy. The dominions of Agamemnon comprised the whole country, afterwards called Achæa, which then was probably peopled by Ionians.

The old tradition, as mentioned by Pausanias (vii. 1.), is, that Archander (leader of men) and Architeles (leader of bands) came to Argos from Phthia (otherwise called Phthiotis) and married two daughters of Danaus King of Argos. From this time the name of Achæi prevailed in the Peloponnesus as a *general* name, though Homer also speaks of Argeii and Danai: the last name clearly having a reference to the ancient dynasty or royal family of Argos. The meaning of this story is, that a tradition prevailed that Argos and Mycenæ were, at a period before the war of Troy, occupied by military bands from Phthiotis, and the prevalence of the name Achæi is to be attributed to the warlike character of this people. According to the Odyssey we find the Achæi also in Ithaca.

Eighty years after the war of Troy (B.C. 1104), a fresh band of invaders from the north, the Dorians, drove the Achæi from Laconia and Argolis. Those who did not leave the country became an inferior caste, and entered into the condition of a conquered people; but a large part retreated to the Ægialeian Ionia, and expelled the Ionians. From this date the name of Achæa was given to that province.

The history of the Achæans forms an inconsiderable part of the general history of Greece till about B.C. 251. During the invasion of Greece by the Persians, they took no share in the battles of Marathon, Salamis, and Platæa; nor, during the long war of twenty-seven years, did they take anything more than a kind of forced part in this protracted struggle between Athens and Sparta. At the commencement of this war (B.C. 431), they were, with the exception of Pelléne, neutral; but afterwards favoured the Lacedæmonian interest, in compliance with the general feeling that prevailed in the peninsula. The cause of their taking no part in the general affairs of Greece may probably have been the want of union among the twelve little states; for though they acknowledged a common origin, and had a kind of connexion, they seem not to have had any complete federal system. Yet they probably attained, at an early period, a considerable degree of prosperity and internal good policy, for we find that the Achæans founded several flourishing colonies in Southern Italy; and the political institutions were considered preferable to those of most states, and were often imitated as a model.

During the struggles of the Southern Greeks against the successors of Alexander, the Achæans still wished to remain neutral; but, like all weak spectators of a contest in which they refuse to engage, they became the prey of the victorious party, and suffered under the Macedonians all the evils of anarchy and civil war. Some cities were compelled to receive first the garrisons of Demetrius and Cassander; and afterwards those of Antigonus Gonatas, or to submit to tyrants. There would be little in the whole history of the Achæan states to attract attention, were it not for the federal union which arose out of these discordant elements.

Four of the western states of Achæa, Dyme, Patræ, Tritæa, and Pharæ (Polybius, ii. 41), seeing the difficulties in which Antigonus Gonatas, King of Macedonia, was involved, formed a union for mutual protection, B.C. 281. Five years afterwards Ægium ejected its garrison, and Bura killed its tyrant, which examples moved Iocas, who was then tyrant of the neighbouring town of Ceryneia, to surrender his authority, and save his life. These three towns joined the new league. In B.C. 251, Aratus having delivered Sicyon, which was not an Achæan town, brought it over to the confederacy, of which he contrived to get himself elected head. In 243, having succeeded in driving the Macedonian garrison out of the strong hold of Corinth, which is the key of Southern Greece, this town also joined the league. Megara, Epidaurus, and Trœzen, followed soon after. Our object is not to write the history of the league, but to show how it gradually rose to importance; we, therefore, refer to the article ARATUS for the events belonging to his period. In the year B.C. 208, five years after the death of Aratus, Philopœmen was elected general of the confederacy, to which he gave a new life by his activity and wisdom (see PHILOPŒMEN). As the Romans had now humbled Philip II. of Macedonia (B.C. 197), and reduced him to the rank of a dependent king, it was their policy to weaken the power of the confederation, and this was easily effected by the Roman and anti-Roman parties, which had been for some time growing up in the Greek cities. In 191, however, Sparta became a member of the Achæan league, and the design of its leaders was to include all the Peloponnesus within its limits. After the death of Philopœmen (B.C. 183) the Roman party grew still stronger under the influence of Callicrates, and the league remained, in appearance at least, on the side of the Romans in their final struggle with Perseus, king of Macedonia, which ended in the defeat and death of the monarch (B.C. 168). The influence of Callicrates was now almost supreme, and, so far from opposing, he urged the Romans to demand 1000 of the noblest Achæans to be sent to Rome to answer for their conduct in the late war. Callicrates and his party had named more than 1000, of whose guilt, however, no proof was adduced; his only object was to humble the party of his opponent Lycortas. Among the accused who were sent to Rome, and there detained for seventeen years, was the historian Polybius, the son of Lycortas, and the strongest support of his father's party.

The last war of the league was with Sparta, which was brought about (150 B.C.) through the influence of Critolaus, one of those who had been detained at Rome. This, which the Romans chose to consider as a kind of attack on themselves, joined to the contumacious treatment of the Roman commissioners at Corinth, which will be presently mentioned, induced the Republic to send L. Mummius to chastise the Achæans; and a fitter man for the purpose could not have been found. The treatment of the Roman commissioners did not tend to soften the ferocity of their barbarian opponent. The Achæan general Diæus met Mummius on the isthmus of Corinth, and fell an easy prey to the Roman general, who, after the battle, burned Corinth to the ground (B.C. 146). Mummius and ten other senators then changed Greece into the Roman province of Achæa, leaving, however, to certain cities, such as Athens, Delphi, &c., the rank of free towns. Corinth afterwards received a Roman colony.

To those who study the history of civil polity, it is a matter of some interest to trace the formation of federative systems, or those by which a number of states unite for certain general purposes, while each maintains all its sovereignty except that portion which is surrendered to the sovereignty of the united states. The object of such associations is two-fold—to secure peace and a ready intercourse between all the states, and all the members of them; and, secondly, to facilitate all transactions with foreign states, by means of the sovereign power given to the united body. Defence against foreign aggression is one of the main objects of such a union; while foreign conquest is, strictly speaking, incompatible with it.

The history of the Grecian states presents us with many examples of federal unions of various kinds, but none is more familiar to the ear than the Achæan, about which, however, our information is not complete, nor yet always precise. We shall endeavour to state what is known in as brief a way as possible.

Each state had an equal political rank, retained its internal regulations, and its coins, weights, and measures, as we know from extant specimens, though the general government also had its coins, weights, and measures, which were uniform. We are speaking of the league as it existed in its completest state. The ordinary general assemblies were held twice a year at Ægium (afterwards at Corinth), and they deliberated for three days. Extraordinary assemblies might meet at other places, as, for instance, at Sicyon. At the Spring meeting, about the time of the vernal equinox, the public functionaries were chosen; the *stratégos*, or head of the confederation, was there chosen, with the *hipparchus* or master of the horse, who held the next rank, and ten functionaries called *demiurgi*. This was the time of election, in the time of Aratus at least. In the earlier times of the league they had two strategi and a secretary, as the Romans had two consuls; but, in B.C. 256, after twenty-five years' experience, it was found that one head was better than two. The strategos appears to have been elected for a single year, and not to have been re-eligible till he had been one year out of office. We find that Aratus filled the office of strategos seventeen times in thirty-three years, and Philopœmen was elected eight times in twenty-four years; Marcus of Ceryneia was the first sole strategos. If the strategos died in office, his predecessor assumed the functions till the legal meeting of the congress. The functions of the ten demiurgi we are not able to state satisfactorily; they probably possessed the legal right to summon and preside in the ordinary meetings; and certainly they must have prepared the business which was to be so summarily despatched in three days. It seems that they had the power, within some limits, of referring matters to the public body or not, according to a majority of votes in their own body: they were, in fact, a committee, having a kind of initiatory (Liv. xxxii. 22). It may be asked how was the general council composed, particularly after the League comprised within itself so many states? Did the states send deputies? Had they, in fact, a representative government? It is difficult to answer this question, though we are inclined to think there was no strict system of representation. The short time for discussion, the two yearly meetings, the general character of Greek democracy, as well as most passages in which the congress is spoken of, lead us to infer that this deliberative body consisted of every citizen of the confederate states who chose to attend. That this, however, could only be the case with the wealthier class, and that the poor could not attend to such business so far from home, must be self-evident. It is also certain that, on extraordinary occasions, a much larger number of men assembled than was usual when things were going on in a more regular course. We read of one special instance (Polyb. xxxvii. 4) when the Roman commissioners were kicked out of the congress, then sitting at Corinth, with scorn (B.C. 147); and Polybius adds, by way of explanation, 'for there was assembled a number of the working class, and of those who followed mechanical occupations, greater than on any former occasion.' As Corinth, however, was one of the greatest manufacturing towns of Greece, and the working class occupied a higher station there than those in most other places, it is possible that the regular meeting was disturbed by a body of intruders, as we sometimes have seen at our own elections. We are, however, inclined to adopt the opinion of there being no representative system in the Achæan congress. Another passage of Polybius tells us that Eumenes offered the congress, then sitting at Megalopolis, a large sum of money, that they might, with the interest of it, pay the expenses of those who attended the congress: this would imply that the number was in *some way* limited, but *how* we do not undertake to say. The offer of Eumenes was rejected. Other matters relating to the Achæan league, though curious to the scholar, are too little fixed to be admissible here.—[See *Polybius*, Book ii. 4, &c. (Hampton's Translation); *Strabo*; *Pausanias*, Book vii.; *Schlosser's Universal History*; *Hermann, Lehrbuch der Griechischen Staatsalterthümer*.]

ACHARD (FRANCOIS-CHARLES), a chemist and experimental philosopher, supposed to have been of French extraction, was born at Berlin in 1753 or 1754, and died in 1821. He was the author of various works, written in the German language, on experimental physics, chemistry, and agriculture; and he was long an active contributor to different scientific journals, particularly the Memoirs of the Academy of Berlin. In 1780 he published, at Berlin, a work entitled *Chymisch-Physische Schriften*, which contains a great number of experiments on the subject of the adhesion of different bodies to each other. Tables containing the results of these experiments, which seem to have been conducted with great care, may be seen in the *Encyclopédie Methodique Chimie*, tom. 1, p. 469.

Achard is, however, chiefly known for his proposal to extract sugar from beet-root. Another Prussian chemist, Margraff, had discovered the existence of a certain portion of sugar in this root, as early as 1747. He communicated his discovery to the Scientific Society at Berlin; but he himself thought it of little practical importance, as he declared he could not produce sugar under 100 francs the pound. Achard, who in this particular appears to have been somewhat of a visionary, on the contrary, described the beet-root as 'one of the most bountiful gifts which the divine munificence had awarded to man upon the earth.' He affirmed that not only sugar could be produced from beet-root, but tobacco, molasses, coffee, rum, arrack, vinegar, and beer. 'The Institute of Paris,' in 1800, gave Achard the honour of a vote of thanks; but after a series of careful experiments they reported that the results were so unsatisfactory, that it would be unwise to establish any manufacture of sugar from beet. But Napoleon, in 1812, succeeded in forming an imperial manufactory of sugar at Rambouillet, when his decrees had deprived France of the produce of the West Indies. The sugar made at home was sold at a great price; and, consequently, after the peace, when foreign sugar was once more introduced, its cheapness put an end to the beet-root establishments. The government of France, however, chose to levy high duties upon the sugars of English colonies to protect those of Martinique, Guadaloupe, and Bourbon; and the tax upon English colonial sugar, being now 95 francs the 100 kilogrammes, or about half a franc per pound, amounts to a prohibition. The beet-root manufacture, therefore, was revived, and is now flourishing, for the sugar so produced pays no duty whatever. In plain words, the manufacture is flourishing, because the people of France are compelled to buy dear sugar instead of cheap. Sugar in that country is only consumed by the wealthy. The average yearly consumption of sugar in France is 4 lbs. for each individual of the population; in the United Kingdom it is 20 lbs. The expectations which Achard formed of the blessings which the beet-root was to produce have not therefore been realized. His plan, like all other plans for raising an article at home which could be obtained better and cheaper by exchange, has only had the effect of keeping the great body of consumers ill supplied, that a few might thrive by a monopoly.

ACHELO'US (now ASPRO POTAMO, or WHITE RIVER) is the largest stream in Greece, properly so called, and was considered navigable in ancient times as far as Stratos, the ruins of which town, if we trust Pouqueville, are about a mile and a half south of a village now called Lepénu. The Achelous rises in the lofty mountain range of Pindus, which is the back-bone of northern Greece, and, after flowing through a very uneven country, enters the level land of Acarnania. Here it discharges itself into the sea; in ancient times having near its outlet the town of Œniadæ. Its general course is from north to south, and its length may be from 120 to 140 miles. In the time of Thucydides (B.C. 431) the lower waters of the Achelous were considered as belonging to Acarnania, but at a later period this river formed a boundary between Acarnania and Ætolia. At the time when the present king of Belgium, Leopold I., had the offer of the sovereignty of Greece from the three great powers, this river was intended to form the north-western boundary of the new state, as far as a point in its course from which it struck eastward through the lakes of Ætolia; but the limits of Greece, it is now understood, will be removed farther north, and determined by a line running from the Gulf of Arta to that of Volo.

The Achelous, flowing from a high mountain range, and in the winter season being loaded with water, carries down an immense quantity of earthy particles, which have formed a number of sand-banks and small islands at its mouth, called in ancient times the Echinades: this phenomenon was remarked by Herodotus one of the earliest observers of geological facts whose writings have come down to us, who compares the increase of the Egyptian Delta, from the quantity of alluvium brought down by the Nile, with the effects produced by the deposits of the Achelous. In the time of Thucydides these islands were increasing so fast, that he predicts (ii. 102) all of them will be shortly joined to the main land; some, he says, were already attached to it. There is still, however, a great number of small islands near the mouth of the Aspro Potamo, but whether some of them have been formed since the time when Thucydides wrote (which is above 2000 years ago), or are the same islands, which the Athenian historian tells us were uninhabited in his time, we do not know. Nothing but a much more minute survey of these islands, and the lower course of the Achelous, together with the present workings of the river, will enable us to come to any probable conclusion as to the changes that have taken place about its mouth. It was a tradition extant in the time of Thucydides that there were no islands at the mouth of the river about a century before the war of Troy; yet, in Homer, we find the Echinades mentioned as sending troops to Troy, while the Echinades of Thucydides' time were uninhabited. All this will tend to prove that the term Echinades was not always used exactly in the same sense as to the number of islands which it included, and also that very great changes had taken place near the mouth of this river. Were the localities examined by some competent person, it might lead to important results as to the progress of deltas within given periods and under certain conditions.

A'CHERON, a small stream of Elis, that runs into the Alpheus; better known for the importance assigned to it in the Greek mythology, than for anything else. In the neighbourhood of this river, says Strabo, they honour Ceres, Proserpine, and Hades. The Acheron was one of the rivers of the realms below, over which the dead had to pass; sometimes the lake is mentioned as the stream which is to be crossed. There was also a river called Acheron, in Thesprotis, a part of Epirus: this stream rises in the mountain range of Pindus, forms, in its course, a considerable lake, called Acherusia, and finally enters the sea, forming a bay, called, by Strabo, Sweet-port (Glykys Limen), and now Porto Phanari.

There was a third river called Acheron, in Southern Italy. The name Acherusia was given to the Lucrine, or else to the lake of Avernus, in Italy; and the hot springs in the neighbourhood were supposed to be near Pyrophlegethon, or the river of fire, in the infernal regions.

It is curious to observe how widely the name of Acheron was diffused by the people of Greek stock, and was always connected with the supposed character of the world below. The origin of this appears to have been some local peculiarities, which fear, proceeding from ignorance in remote ages, turned into objects of superstitious veneration. Even on the coasts of the Euxine, near Heraclea (Erekli), we find a peninsula called Acherusia, where Hercules is said to have descended to bring up the dog Cerberus. The Greek historian, Xenophon, who gravely reports this story, adds, what is more important, that there is there a deep chasm or ravine, extending several hundred yards in length.

ACHILLEA, a genus of plants, consisting of sixty or seventy species, found exclusively in the colder climates of the northern hemisphere. They are all herbaceous, perennial weeds, of little importance, except to botanists, and are only seen in cultivation in the collections of the curious.

ACHI'LLES. One of the most celebrated characters of the mythic age of Greece; a distinction due rather to his having been selected by Homer as the hero of the Iliad, than to the number or wonderful nature of the exploits ascribed to him. He belongs to that intermediate period between truth and fiction, during which it is generally hard to say how much is real—how much imaginary. In the circumstances of his life, however, as they are told by Homer, there is scarcely anything impossible, or even improbable, allowing for a reasonable quantity of poetical embellishment. Beyond Homer's account, however, everything is fabulous; and as poets seem to have regarded these mythic stories as fair ground on which to exercise their own taste and invention, careless of making their additions consistent with what others had said before, it is not wonderful that the accounts of this prince, as of many others, abound in contradictions which it would be fruitless to try to reconcile.

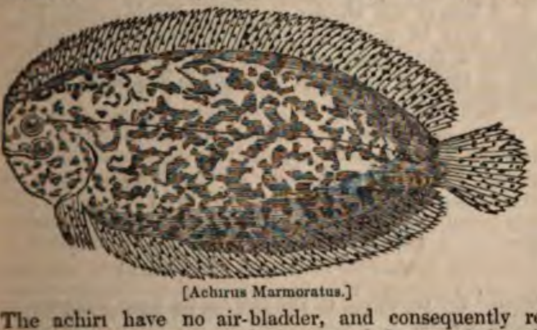
The story of Achilles, as we find it in Homer, is soon told. He was the son of Peleus, king of Phthia, (see Achæi,) and the adjoining parts of Thessaly, and of Thetis, a sea goddess, daughter of Nereus. He was educated by Phœnix, a refugee, at his father's court. Fate had decreed that, if he fell before Troy, he should gain everlasting renown; if he returned home he should enjoy a long but inglorious life. He chose the former alternative, and joined the Grecian army, in which he was pre-eminent in valour, strength, swiftness, and beauty. During the first nine years of the war we have no minute detail of his actions in the tenth a quarrel broke out between him and the general-in-chief, Agamemnon, which led him to withdraw entirely from the contest. In consequence the Trojans, who before scarcely ventured without their walls, now waged battle in the plain with various issue, till they reduced the Greeks to extreme distress. The Greek council of war now sent its most influential members to soothe the anger of Achilles, and to induce him to return to arms, but without effect. He allowed his friend and companion, Patroclus, however, clothed in the celestial arms which Hephæstus (Vulcan) gave his father, Peleus, to lead the Myrmidons, his followers, out to battle. Patroclus was slain, and stripped of these arms by Hector. Rage and grief induced Achilles now to return to battle. Thetis procured from Hephæstus a fresh suit of armour for her son, who, at the close of a day of slaughter, killed Hector, and dragged him at his chariot wheels to the camp (not thrice round the city, as in later authors). Here ends the history of Achilles, so far as it is derived from Homer, except that we may infer, from a passage in the last book of the Odyssey, that he was slain in battle under the walls of Troy. But the genuineness of the last book of the Odyssey has been disputed both by some excellent ancient and modern critics, and, as we think, on very good grounds.

By later authors a variety of fable is mixed up with this simple narrative. Thetis is said to have dipped him, while an infant, in the Styx, which rendered him invulnerable except in the heel, by which she held him, and he was killed at last by a wound in the heel. The centaur Chiron is made his tutor, instead of Phœnix, and feeds him upon the marrow of lions and other wild beasts, to improve his strength and courage. From this singular instructor he learned music and a number of sciences, even before the age of nine years, at which Thetis, anxious to prevent his going to Troy, removed him, disguised as a girl, to the court of Lycomedes, king of the island Scyros. Here he became the father of Neoptolemus, or Pyrrhus, by the king's daughter, Deidamia, rather precociously; for he had not been a year on the island, when Ulysses was sent by the confederate Greeks to seek him, in consequence of an oracle, which declared that Troy could not be taken without the help of Achilles. Ulysses arrived at the island, discovered him among the females of Lycomedes' household, and carried him away to join the army. He was betrothed to Iphigenia, daughter of Agamemnon. The manner of his death is variously told. Some make him fall in battle; others say that he was treacherously slain in a temple, on the occasion of his nuptials with Polyxena, daughter of Priam; but it is generally agreed that he was killed by Paris, Apollo aiding him, and directing his arrow. He was entombed on the promontory of Sigæum, and a mighty barrow raised over his remains, which still rivets the attention of travellers; though it must always remain doubtful to whose memory this mound of earth was really raised. Here Alexander of Macedon celebrated splendid games in honour of the hero whom he affected to emulate.

The most valuable historical facts relative to Achilles are contained in the following passage of *Homer's Iliad*, book II. 681, &c., where he is giving a list of the warriors who went to Troy:—'I will now tell of those who inhabited Pelasgic Argos, with Alus, Alope, and Trechis; and those who dwelt in Phthia and Hellas, famed for beautiful women, and were called Myrmidons, and *Hellenes* and *Achæi;* the commander of their fifty ships was Achilles.' From this we learn that there was a people in Thessaly called Achæi, as well as a people in the Peloponnesus; and we see also that the name of Hellenes, afterwards the generic name of the Greek nations, originated, as far back as we can trace it, in the basin of Thessaly.

ACHI'LLES TA'TIUS, a Greek astronomer, who lived, probably, in the first half of the fourth century of our æra, and wrote a treatise on the sphere. There is still extant a fragment of Achilles Tatius, entitled *An Introduction to the Phænomena of Aratus:* it may be seen in the Uranologion of Petavius. Suidas, the lexicographer, confounds this Achilles Tatius with another of the same name, called by him Achilles Statius, who lived later, and wrote a Greek romance, *The History of Leucippe and Clitophon*. This Achilles was a native of Alexandria in Egypt, and though it is difficult to fix his era with any precision, we may assume him to be later than Heliodorus, whose romance served as a kind of model to all the subsequent Greek writers of that class, as well as to Achilles. Probably, Achilles Tatius wrote near the close of the fifth century. His romance is in eight books, and is preferred by some of the earlier critics to that of Heliodorus, which latter, however, appears to us one of the most insufferably tedious stories that ever was written. Later critics give the preference to Heliodorus. Those who have not the opportunity of reading the Greek romance writers, may form some idea of their subjects, and the mode of treating them, by dipping into some of the older romances of modern times, such as *Apollonius, King of Tyre*, on which the tragedy of *Pericles*, which, bad as it is, has been supposed to have had some touches from Shakspeare, is founded. The Greek romance writers give us no vivid picture of the times in which they lived, but a distorted image of forms of society far anterior to their own age, without being able to infuse into them the spirit of historic truth. [*Schoell, Hist. Greek Litt.*—See an article on the Greek Romances in the *Foreign Quarterly Review*, No. 9.]

ACHI'RI, in Ichthyology, a genus of flat-fish, belonging to the order Malacopterygii, and family Subbranchia, of Cuvier. In external form these animals resemble the common sole: like the pleuronectes, in general, they have the body and tail very much compressed, and the eyes both on the same side of the head; but they are easily distinguished from all other genera of flat-fish by the total want of pectoral fins. These organs, it is true, are very much reduced in all the pleuronectes; because, being placed in a different situation from the fins of ordinary fishes, they no longer perform the same functions in relation to the medium in which they move, but the stability of the animal's equilibrium is preserved, and its movements of locomotion performed, by the dorsal and caudal fins, instead of by the pectoral and ventral. Hence it is that the former fins always acquire such an enormous development in flat-fish; being generally continued in an uninterrupted line from the head to the tail, and not unfrequently surrounding the whole body.



[Achirus Marmoratus.]

The achiri have no air-bladder, and consequently remain, for the most part, at the bottom of the sea; being, in fact, ungifted with the faculty of increasing or diminishing their specific gravity, which the possession of this important organ bestows upon ordinary fishes. Their power of locomotion in other directions is, however, considerable; and, notwithstanding the disadvantages of their form, and the oblique direction in which this necessarily compels them to move, their motions are frequently very rapid. Their habits, as far as at present known, are similar to those of the other pleuronectes. They are found in the warmer regions both of the East and West Indies, but not in deep water, or in situations far removed from land; they abound along the shores, and furnish a plentiful and wholesome food to the inhabitants.

Lacepede and some other naturalists have divided the achiri into two subgenera; the first of which is distinguished by having the eyes on the right side of the head, and the caudal fin distinct from the dorsal and anal; the second, by having the eyes placed on the left side, and the dorsal and anal fins joined to the caudal, so as to form but a single uninterrupted line of fin around the entire body, the head alone excepted.

Various species of achiri have been enumerated by zoologists, the most remarkable of which appears to be the *Achirus Marmoratus* of Lacepede. This species has the caudal fin distinct from the anal and dorsal, all of which are of a pale bluish-white colour, sprinkled with innumerable small black spots; the body is covered with very diminutive scales, and the flesh is of a delicate flavour, and highly esteemed: it inhabits the coasts of the Isle of France. But the most remarkable fact relating to this species is reported by Commerson, who informs us that there is a small pore at the base of each of the rays of the fins, from which issues, upon pressure, a milky fluid of the consistence of olive oil. We are entirely ignorant of the purposes which this fluid serves in the economy of the animal; undoubtedly, it has its uses, and probably is under the control of the creature's volition, and may assist it, in some manner, either in capturing its prey, or in eluding the attacks of its enemies. The *Achirus Pavonicus* is distinguished by the beauty of the spots, which, like the eyes on the peacock's tail, cover its body; and the *Fasciculatus* and *Bilineatus* are easily recognized by the characters from which they respectively derive their names. The former is found on all the coasts of America and the West Indian isles: the latter inhabits the shores of China, and feeds upon small crustacea and mollusca. It has a long intestinal canal, with numerous reduplications; its jaws are armed with short obtuse teeth; and each of its nostrils has two distinct orifices. Various other species are found in the Atlantic and Indian oceans: they are enumerated in a note, vol. ii. p. 343, of the second edition of the *Règne Animal*, and described at length by Lacepede, and other writers upon ichthyology. To these sources we must refer such of our readers as are desirous of further information regarding the external forms, and specific differences of the achires. All that is known of their habits and economy has been brought together in the present article.

ACHMIN, or ACKMIN, a town in Middle Egypt, N. lat. 26° 38′, on the right bank of the Nile, with which it is connected by an ancient canal. Achmin contains above 3000 inhabitants, who manufacture some coarse cotton cloth; 2000 are Catholic Copts, who have a large church. This town is the Chemmis of Herodotus and other Greek writers, the Arabic name, Achmin, being formed by prefixing the letter A, which we find to be the case in many other names. Herodotus mentions a large temple here with colossal statues. At present there are the ruins of two temples to be seen at Achmin, and on an architrave, at this place, a Greek inscription has been discovered, which contains a dedication to the god Pan; thus confirming the opinion that the Panopolis of the later writers was the old Chemmis of Herodotus, a name which endures to the present day. The hills in the neighbourhood of this town are full of excavations, which perhaps originally served to receive the mummies of Chemmis, and afterwards to shelter the Christians during the cruel persecutions of Diocletian. [See *Egypt, Society—Ritter, Afric.*]

ACHRAS, a genus of tropical plants belonging to the natural order Sapoteæ. The name strictly belongs to the wild pear, and seems to have the same root as Acacia, Acanthus, and other words indicating something prickly. Linnæus, with a capriciousness too usual with him, gave it to this West Indian genus, which has nothing whatever in common with the pear.

GENERIC CHARACTER.

Calyx divided into six parts.
Corolla monopetalous, divided into six lobes.
Stamens twelve; of which six are sterile, and six fertile.
Ovarium with from six to twelve cells.

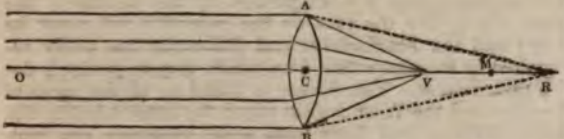
Fruit resembling an apple, with from one to twelve seeds, contained in hard bony nuts, which have a shining coat, and a long hard scar over the whole of their inner angle.

The genus contains only one species, which yields a copious milky fluid when wounded. Its leaves are entire, leathery, undivided, shining, of a lanceolate form, without stipulæ. The flowers are large, white, bell-shaped, and grow singly from the axillæ of the leaves. This is called, in the West Indies, the *Sapodilla Plum*, and *Nispero* by the inhabitants of New Spain. The fruit in size and shape resembles a bergamot pear: like the medlar, it is only eaten in a state of decay; before that period it is austere and uneatable, but in the proper state it is so rich and sweet, as by some to be considered only inferior to the orange. For other presumed species of Achras, see LUCUMA.

ACHROMA'TIC. An optical term, derived from the Greek, and signifying 'without colour.' It is used in speaking of telescopes and other combinations of glasses, to designate those which are so contrived that the light which is broken into various rays of different colours by one glass, is re-collected, or nearly so, by another; so that the image does not present those coloured fringes round its edge, which are always observable in bad telescopes.

It is well known that light is not a simple body, but is divided or decomposed into various colours by passing it through glass, or any other transparent substance, the sides of which are not parallel to one another. [See Society's Optics, ch. viii. ix.; also the articles PRISM, SPECTRUM.] That is, whenever an object is seen through a common lens, there are, in fact, several images which arise from rays of different colours being collected at different points, as follows:—

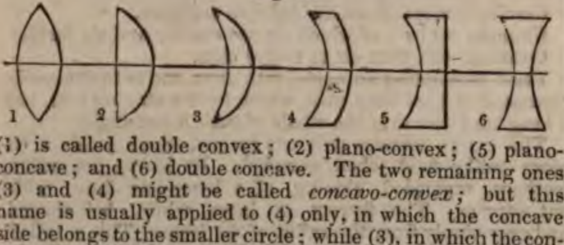
Fig. 1.



A B is the section of a double convex lens, which may be made by the revolution of the figure A B about the axis O R. We suppose rays to fall upon it coming from a point in the axis O R so distant from the lens, that they may be considered as parallel. The light in passing through the lens is refracted; that is, the rays of each separate colour are directed nearly to the same point, the violet rays being brought nearest to the glass at V, and the red rays being farthest from it at R. Between V and R will be scattered a succession of images of those colours which lie between the violet and red. In this we observe two distinct effects. First, the general *refraction* of the rays, by which they are bent so as nearly to meet in one point. This is usually measured by the *mean* ray, or the colour which falls in the middle between V and R; and of two lenses of the same form, but of different substances, that is said to have the greatest refraction which brings the mean image M nearest to C, the centre of the lens. Secondly, the separation of the images V R, which bears a certain proportion to C M, is called the *dispersive power* of the medium. Thus, if two lenses of the same form, but different substances, have V R the same in both, it does not follow that the dispersive powers of the two are the same. If C M should happen to be in the first substance double of what it is in the second, V R being the same in both, the dispersive power of the first would be only half that of the second. The dispersive power is found thus:—Divide the difference between the *refractive indices* (see REFRACTION) for red and violet rays, by the refractive index of the mean ray diminished by unity. To make A B achromatic, we must find another substance, differing from the substance of A B, so that some lens of it, placed before A B, will collect the light scattered by A B, without causing the rays again to become parallel to one another. To do this we first lay down the following rules for computing the distance of any one image from the centre of the lens, or what is called the *focal* distance of that image. These may be seen more at length in the art. LENS.

I. There are six species of lenses, made by the revolutions of the following figures about the axis:—

Fig. 2.



(1) is called double convex; (2) plano-convex; (5) plano-concave; and (6) double concave. The two remaining ones (3) and (4) might be called *concavo-convex;* but this name is usually applied to (4) only, in which the concave side belongs to the smaller circle; while (3), in which the concave side belongs to the larger circle, is called the *meniscus.*

II. Of these, in (1), (2), and (3), parallel rays are made to converge as in *fig.* 1,—that is, they are actually collected on the other side of the lens: in (4), (5), and (6), on the contrary, they are made to *diverge,*—that is, they are not collected at all, but proceed as if they came from some point on the same side of the lens as that on which they fell; the general rule is, that those with sharp edges make parallel rays converge, while those with flat edges make them diverge. It is usual to give the name of *convex* to the sharp-edged, and of *concave* to the flat-edged lenses.

III. To find the focus, that is, either the point at which the rays really do converge, or that from which they appear to diverge, divide the product of the radii of the surfaces by their sum, when both sides are of the same name (that is, for the double convex and double concave); by their difference, when the sides are of different names (that is, for the meniscus or concavo-convex), and divide the quotient by the refractive index of the substance, diminished by unity. The result is the distance of the focus from the centre of the lens. When one side is plane (as in the plano-concave and plano-convex), divide the radius of the other side by the refractive index diminished by unity. For common glass the refractive index is nearly $\frac{3}{2}$, or, according to Dr. Brewster, varies from 1·5 to 1·54 for *plate* glass, from 1·525 to 1·563 for *crown* glass, and from 1·576 to 1·642 for *flint* glass. This, diminished by unity, is nearly $\frac{1}{2}$ in all cases, and dividing by $\frac{1}{2}$ is the same as multiplying by 2. Hence, for a double convex lens, the radii of whose surfaces are 6 and 8 inches, the product of 6 and 8 divided by the sum of 6 and 8 is 3 inches, and $\frac{3}{7}$ of an inch nearly; and twice this quantity gives 6 inches and $\frac{6}{7}$, or 4 inches nearly, for the *focal distance* of the lens.

IV. When two lenses are placed close together, one of which has sharp edges and the other flat, and parallel rays fall on them, the focus of the two together falls on the side of the stronger, or of that which has the *least* focal distance. When both edges are sharp or both flat, the focus of the two falls on the same side as that of either lens.

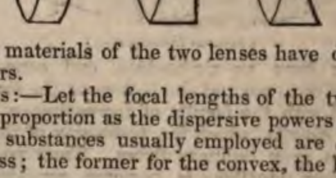
V. The focal distance of such a compound lens is found by dividing the product of the single focal distances by the sum, when both are sharp or both flat; or by the difference when one is sharp, and the other flat on the edge.

To make one lens achromatic by the addition of another, involves a process of reasoning which we shall omit, and merely give the result:—

1. No such single additional lens can give entire achromatism or absence of colour; all it can do is to bring some two images of different colours into the same place. If we thus choose to bring the two extreme images together, the remaining ones, though not actually brought into the same place with the two first mentioned, will yet come so near them, that, for practical purposes, the object in view will be attained.

2. A lens of the convex species, a double convex for instance, may be made very nearly achromatic, by applying to it one of the concave species, which fits one side of it exactly, so that the section of the double lens shall be one of the following—

Fig. 3.



provided the materials of the two lenses have different dispersive powers.

The rule is:—Let the focal lengths of the two lenses be in the same proportion as the dispersive powers of their material. The substances usually employed are *crown* glass and *flint* glass; the former for the convex, the latter for the concave lens.

The dispersive power of flint glass is nearly double that of crown class; while the refractive powers of the two are nearly the same for the *mean* image. Suppose we have a convex lens of plate glass, of 10 feet focal distance for the mean image, which we wish to achromatize by a lens of flint glass, the refractive indices being as follows—

	Red.	Mean.	Violet.
Crown . . .	1·526	1·533	1·547
Flint	1·623	1·637	1 666

The dispersive power of the crown glass, or, as before explained, the quotient of ·021, the difference between the red and violet refractive indices, divided by ·533, is ·0394. That of the flint glass, or ·043 divided by ·637, is ·0675. Hence, 10 is to the focal distance of the lens required as ·0394 to ·0675, or as 394 to 675, which gives 17 feet 2 inches nearly, so that the focal length of the whole lens, found as in rule (5), is about 24 feet.

If the focal length of the concave lens be too short for the purpose, the defect may be remedied by separating the lenses a little, instead of putting them close together.

By the preceding account, some idea may be formed of the manner in which chromatic aberration is destroyed in the object-glass of a telescope. Newton, who imagined that the dispersive and refractive powers were always in the same proportion, thought it would be impossible to construct an achromatic glass. This was first done, as far as we know, about the year 1730 by Mr. Hall, a gentleman of Essex; but he concealed his discovery. Dollond (see his life) was the first who publicly made achromatic telescopes. Huyghens had accidentally constructed an achromatic *eye-glass*, in the course of an experiment for a different purpose. On this part of the subject consult the article TELESCOPE; we also refer the mathematical reader to Mr. Coddington's Optics, and to a paper by Professor Airy, on achromatic eye-pieces, published in vol. ii. of the *Cambridge Phil. Trans.*

ACIDS. The acids are a numerous and important class of chemical bodies. As the word acid is, in common language, almost synonymous with *sour*, it might be supposed that the taste of a substance would determine whether it was included among the acids. The term has, however, been so much extended by chemists beyond its original meaning, that some bodies, which are nearly or quite devoid of sourness, are considered as acids because they agree with them in some other qualities. The acids are generally sour; usually, but not universally, they have great affinity for water, and are readily soluble in it: they redden most vegetable blue colours, and combine readily with alkalis and earths, and act upon and unite with most metals, or their oxides, with great facility. These are the properties of the greater number of acids; but the last only—namely, great powers of combination—belongs to them all. Many acids are entirely natural products, some both natural and artificial, while others are altogether the result of chemical agency. They are derived from various sources, and, except in the few particulars above-named, they vary greatly in their properties. Thus, under common circumstances of temperature and pressure, some are gaseous in form, as the carbonic acid; others are fluid, as the nitrous, or solid, as the boracic acid; some require water or a base to retain their elements in combination, which is the case with the nitric acid, while others, as the sulphuric, may exist independently of either. Most acids are colourless, but the chromic is red; some are inodorous, as the sulphuric; others pungent, like the muriatic acid: there are acids which are comparatively fixed in the fire, the phosphoric for example; others are volatilized by a more moderate heat, which is the case with the sulphuric acid; whilst those which are pungent to the smell, like the muriatic acid, are, to a certain extent, volatile at all temperatures.

No simple or elementary substance has the properties of an acid, and consequently all acids are compounds of two or more of them. In almost every case one of these elements is either oxygen or hydrogen; those acids which contain the former are sometimes termed *oxacids*, and those into the composition of which hydrogen enters are called *hydracids*. Oxygen in some instances gives rise to different acids, by combining with the same element in various proportions; thus, oxygen and azote form three acids, which is also the case with oxygen and sulphur, and oxygen and phosphorus; but hydrogen does not in any case combine with the same element to form more than one acid. The oxacids greatly exceed the hydracids in number.

Acids occur in all the kingdoms of nature; the phosphoric acid existing in bone is of animal origin; the citric and the oxalic acid are products of vegetation; while the chromic and the arsenic acid enter into the composition of certain minerals. In many instances, however, acids are not exclusively derived from one source, but are sometimes produced by them all, and may be also artificially formed. This is the case with the phosphoric acid, which occurs in animals, plants, and minerals, and is formed whenever phosphorus is burnt the citric acid is produced only by the process of vegetation; but the oxalic acid, also found in plants, may be obtained by chemical agency. The carbonic and the sulphuric acid are very common in mineral bodies, and may also be artificially produced; the former is also one of the results of respiration, combustion, and of animal and vegetable decomposition; and both the carbonic and sulphuric acid may be obtained by combining their bases with oxygen. The chromic and the arsenic acid are found only in mineral bodies, but they may be formed by chemical agency; and, indeed, except many of the vegetable acids, there are but few which cannot be so prepared.

Soon after Dr. Priestley's celebrated and important discovery of what he called *dephlogisticated air*, in 1774, it was found that several substances, such as sulphur and phosphorus, were converted into acids by combining with this elementary gas. On this account it was assumed, hastily and incorrectly, that all acids contained dephlogisticated air, and derived their acidity from it; on this account the name *oxygen* was given to it, signifying *acid-making*, and it was regarded as the universal acidifying principle; not, indeed, that it always formed an acid when combined with a body, but that no acid existed without it. It has, however, since been found that there are acids, the muriatic acid for example, which contain no oxygen: and, further, it has also been proved, by the brilliant discoveries of Sir H. Davy, that oxygen, by combining with certain elementary bodies, converts them into *alkalis;* a class of substances possessing properties diametrically opposite to those of the acids.

Although, as already mentioned, oxygen or hydrogen is present in almost every acid, yet on account of the very different classes of bodies of which they frequently form a part, they are not regarded as acidifying principles: acidity, like form, colour, and other less obvious properties, is to be considered as the result of chemical action and combination, and not as derived from the agency of any peculiar principles.

The means adopted for preparing the acids, whether from the natural compounds which contain them, or by the direct combination of their component parts, are almost as various as the acids themselves. For an account of the processes employed in obtaining them, and of the numerous and important purposes to which the acids are applied in medicine, science, and the arts, or for domestic uses, we refer the reader to each particular acid.

It may be here proper to notice the method adopted by the framers of the French nomenclature, in giving names to different acids. It has been already mentioned, that oxygen was supposed to be the acidifying principle, and it was found that, by combining in different proportions with the same substance, it formed acids of very different properties; but it was not then known that oxygen combined with any one body to form more than two acids. It was, however, proved to unite with sulphur in two different proportions; and in this, and similar cases, the name of the acid which contained least oxygen was made to end in *ous*, and that which contained more in *ic;* thus sulphur*ous* acid contains less oxygen than sulphur*ic* acid.

Cases have, however, occurred during the progress of chemical science, requiring an extension of this principle: an acid has been formed which contains less oxygen combined with sulphur than in the sulphurous, and this is called *hypo*sulphurous acid; and another containing more oxygen than the sulphurous, but less than the sulphuric, and this is termed *hypo*sulphuric acid. An acid has also been formed which contains more oxygen than the chloric—this has been called *per*chloric acid: the term is objectionable for reasons hereafter to be stated; *oxi*chloric is a better, and *hyper*chloric the best name. Although in the course of the present work some acids of minor importance will occasionally be mentioned, the following are those which, as being used either in scientific researches, in medicine, or the arts, will be more particularly treated of in their respective places:—

ACIDS.

Acetic
Antimonic
Antimonious
Arsenic
Arsenious
Benzoic
Boracic
Bromic
Camphoric
Carbonic
Chloric
Chloriodic
Chlorocarbonic
Chlorocyanic
Chromic
Citric
Columbic
Cyanic
Ferrocyanic
Fluoboric
Fluosilicic
Formic
Fulminic
Gallic
Hydriodic
Hydrobromic
Hydrocyanic
Hydroselenic
Hyponitrous
Hypophosphorous
Hyposulphuric
Hyposulphurous
Iodic
Kinic
Lactic
Lithic
Malic
Manganesic
Manganesious
Meconic
Molybdic
Mucic
Muriatic
Nitro-muriatic
Nitrous
Oleic
Oxalic
Oxichloric
Pectic
Phosphoric
Phosphorous
Pyrophosphoric
Saccholactic
Sebacic
Selenic
Selenious
Stearic
Succinic
Sulphuric
Sulphurous
Sulphocyanic
Sulpho-naphthalic
Sulpho-ornic
Tartaric
Titanic
Tungstic

ACONITE, WINTER. [See ERANTHIS.]

ACONI'TUM, a genus of poisonous plants belonging to the natural order Ranunculaceæ. From very early times it has borne the same name, and has been known for the dangerous properties of many of its species. They are all hardy, herbaceous plants, many of them of great beauty; and are so easily cultivated, that one of them, A. Napellus, is found in every cottager's garden. The English call them *Wolf's-bane*, which name corresponds with the French *tue-loup* (kill-wolf). From all other ranunculaceous plants, Aconitum is at once known by its having the very large uppermost segment of its calyx overhanging the petals and other parts in the form of a helmet.

The common species, *A. Napellus*, is one of those in which the greatest degree of virulence has been found to reside.

Aconitum Napellus.

It is a native of Alpine pastures in Switzerland and other mountainous parts of Europe. Its leaves are very dark green, deeply cut into from five to seven long segments. The stem is about three feet high. The flowers are in long stiff spikes, and of a deep blue colour; they appear from May to July. All the parts of this plant are extremely acrid, especially the roots, which are scraped and mixed with food to form a bait for wolves and other savage animals. According to the observations of Orfila, the juice of the leaves introduced into the stomach occasions death in a short time; the root is far more energetic. The poison acts upon the nervous system, especially the brain, producing a sort of phrenzy.

These properties are probably found in all the species of the genus. *A. cammarum*, *lycoctonum*, and *anthora* are certainly equally dangerous. None of them, however, not *A. Napellus* itself, can be compared for fatal energy with the dreadful *Bikh* or *Bish* of Nepaul, the *Aconitum ferox*, which seems to possess the concentrated power of all the European species.

ACO'NTIAS, in Zoology, the name of a genus of serpents established by Baron Cuvier for the purpose of distinguishing certain species hitherto confounded with the *Angues*, or common snakes. but which recent observations have proved to differ from these animals in their habits and internal anatomy. The family of serpents which M. Cuvier denominates *Anguis*, differs from all other ápodal (footless) reptiles in certain peculiarities of osteology and internal structure, whereby they approximate more nearly to the lizards than to the true serpents. Some writers have even gone so far as to include them among the genera of the lizard family, whilst others are more inclined to consider them as forming a distinct and separate family of themselves, intermediate between the two. In fact, the generality of these animals, though externally deprived of feet, have yet an imperfect pelvis and a complete sternum, omoplate (shoulder-blade) and clavicle, concealed beneath the skin; their bodies are uniformly covered, both above and below, with small scales, as in the common lizard; and the osteology of the head is in all respects similar. But these characters, so unequivocal in other genera of the family Anguis, are for the most part wanting in the Acontias, which are thereby definitely distinguished, and form, as it were, the passage from the common snakes to the true serpents. It was upon these considerations that M. Cuvier was induced to establish this new genus. It is characterised by the absence of all the bones which represent the extremities in the other angues, while it retains the structure of the head common to these animals and to the lizards, and has the body similarly covered with small scales only, without the horny plates which guard its under surface in the common serpents, and protect them from injury in the various rapid motions which they perform.

As might naturally be expected from this conformation, the progressive movements of the acontias are very different from those of common serpents. They do not glide along the surface like these animals, but boldly carry their heads and breasts erect, and if closely pursued defend themselves courageously, and dart with the velocity of an arrow against their assailant. Though dreaded in their native countries, because confounded with their venomous congeners, these animals are perfectly harmless, and neither possess the means nor have the desire of being injurious. They have no poison fangs, and their cheek-teeth are so small as, in some species, to be barely perceptible. Their habits are gentle; and they are so timid that they generally fly at the least noise, or, upon the slightest appearance of danger, conceal themselves under some shrub or tuft of grass, or even bury themselves underground when no other refuge is at hand.

[Acontias Meleagris.]

The species belonging to this genus are, generally speaking, of a small size; and, as their mouths are not susceptible of the enormous dilatation possessed by the true serpents, they are incapable of swallowing any animal approaching to their own dimensions, and feed upon worms and insects. Different species of acontias are found in almost every part of the old world. The arid plains of Syria and Palestine produce a species which has been mentioned by the prophet Isaiah (c. xxxiv. v. 15), under the Hebrew denomination *Kippoz*, improperly translated *the great owl* in our common version of the Sacred Scriptures, but which the learned Bochart (*Hierozoicon*, pars post. lib. iii. cap. xi.) has shown to refer more properly to the acontias or anguis jaculus, the arrow or dart-snake of the Greeks and Romans. Other species inhabit Asia Minor, Egypt, and Persia; their singular mode of progression could not fail to attract the attention of the ancients, who often mention them by the appellation which M. Cuvier has lately revived. India and China have also their acontias; and the Cape of Good Hope produces a species without eyes.

Of the common Egyptian Acontias many fables are recorded by ancient authors, principally arising from confounding this really harmless species with the more deadly and venomous serpents of the same localities. Agatharchides, Diodorus, and Strabo, call the Acontias the most poisonous of all serpents, and consider its bite to be absolutely incurable; Ælian relates that it will occasionally spring to the distance of twenty cubits; Galen, Isidorus, and others, say that it lurks among the branches of trees, from whence it darts suddenly upon whatever animal happens to come within its reach; and Avicenna even adds that it propels itself with so much force in these formidable springs, as to bury itself, like an arrow, in the body of its victim. All these fables, and many others recorded of this serpent, plainly arise, partly from the habits and mode of progression peculiar to the Acontias, and partly from confounding it with the Cerastes, or horned viper, the Dipsas, Asp, and other Egyptian species. Nor have the poets failed to contribute their share to the general stock of wonders related of this animal. Lucan, for instance, often mentions it with many of the attributes above recorded; and indeed its natural habits, without the aid of imaginary qualities, are too remarkable to be overlooked, even by the most inattentive observer.

It is no part of our plan to give a complete enumeration of the species which have been described as belonging to this or any other common genus of reptiles. Such a dry and formal catalogue would possess few charms for the general reader, and be of little use to the scientific zoologist. We must, therefore, refer those who are desirous of further information concerning the names and descriptions of these serpents, to the works of Merrem, Schneider, Lacepede, and Daudin, where their curiosity will be amply gratified.

ACORINÆ, in Botany, a section of Aroideæ, which see.

ACORN, the English name of the fruit of the oak. [See Quercus.]

A'CORUS, the botanical name of the plant that produces the drug called in the shops *Calamus aromaticus*. It belongs to the natural order Aroideæ, in the acrid properties of which it participates in a slight degree, and is found abundantly in the fresh-water marshes of many parts of England. It has a perennial, creeping, horizontal stem, as thick as the finger, the whole of the under side of which emits roots into the mud or soft earth, in which the plant uniformly grows. From this spring many deep-green, sword-shaped leaves, about three feet long. In the midst of all is a leaf-like stem, from below the point of which protrudes a cylindrical, or rather conical, spadix of greenish flowers, which are so closely packed together, that the stalk is not to be seen. The leaves when bruised are fragrant; for which reason they were formerly employed to strew the floors of rooms, or of churches, under the name of rushes. This practice is still maintained in some places, where the plant is common, as at Norwich, the cathedral of which city is strewed with sweet rushes upon certain high festivals. The flowers are so seldom produced, that it is a common belief that they never are borne. *Calamus aromaticus* is slightly aromatic, and is occasionally used as a stimulant; but is of very little importance. The part employed is the dried creeping stem, or, as it is improperly called, root.

[Acorus Calamus.]

ACOSTA (JOSEPH D'), a Spanish writer of the sixteenth century. He was born at Medina del Campo in Leon, about the year 1539; and, before attaining the age of fourteen, entered the Society of the Jesuits, to which his four elder brothers already belonged. He was remarkable, while pursuing his academic studies, for his diligence and his rapid progress both in literature and science; and on finishing his course, he became Professor of Theology at Oraña. This situation he retained till 1571, when he was dispatched as a missionary to South America. He was eventually made provincial of his order at Peru; and did not return to Spain till 1588. During his residence in South America, he had employed part of his time in writing an account of that continent, which was published at Seville, in 4to. in 1590, under the title of *Historia Natural y Moral de las Indias*. This work, which has been often reprinted (the edition of 1591, in 8vo., having received considerable corrections and additions from the hand of the author), is highly esteemed as an authority on the early condition of South America. It has been translated into French, Italian, German, Dutch, and English. The English translation, which appeared at London, in 4to., in 1604, and again in 1684, bears to be performed by E. G., supposed to be the initials of Edward Grimestone. There is also a Latin translation of the work in Part IX. of De Bry's *Collectiones Peregrinationum in Indiam*. Acosta, after his return to his native country, became a great favourite of Philip II., and had successively the dignities of Visitor of his order for Arragon and Andalusia, Superior of Valladolid, and Rector of the University of Salamanca. While holding this last situation he died on the 15th of February, 1600. Besides the work we have mentioned, he is the author of another on the same subject, published in 1589 in Latin, under the title of *De Natura Novi Orbis Libri Duo*, which was afterwards translated by himself into Spanish, and inserted in his history. He is also the author of several theological treatises; and, among the rest, of a volume of sermons, in Latin.—[*Moreri — Biog. Univ. — Robertson's America — Biblioth. Scriptor. Soc. Jesu, a Ribadeneira, Allegambe, et Sotvello.*]

ACOTYLE'DONES, or ACOTYLEDONEÆ, the name of the first class in Jussieu's Natural System of Botany. It is derived from the circumstance of all the plants which it comprehends vegetating without the aid of the seed lobes called cotyledons. Such plants are also in all cases destitute of flowers, and are in fact the same as what Linnæus called *Cryptogamous*. It having been found, by more recent and exact observations —1. That many plants, that really do bear flowers, have no cotyledons; and 2. that all flowerless plants are altogether destitute of seeds, so that they might as well be named *aspermous* as *acotyledonous*, because cotyledons can only be present in seeds strictly so called, the term Acotyledones has fallen into disuse, and Cellulares has been substituted for it, which see.

ACOUCHY, a small species of Cavy, sometimes called the Surinam Rabbit.—(See Agouti.)

ACOUSTICS, a word derived from the Greek, and signifying, the science of hearing. In treating this, and all other general scientific terms, we shall confine ourselves to the elucidation of those first principles, without which the applications cannot be understood; noticing the application only so far as their mention can be made serviceable in explaining and referring to particular articles for more specific information. Thus the reader must consult the articles Pipe—Chord—Vibration—Harmonic—Speaking Trumpet—Ear—Larynx—Echo, &c., for many explanations, which it would be necessary to insert here, if we were writing a treatise on acoustics.

We need not say what sound is, or dwell on the fact that some sounds differ only in intensity or loudness, as the reports of a cannon and a musquet; others in musical pitch, as two notes of the same instrument; others again in character or tone, or, as the French call it, *timbre*, such as the same note sounded on a flute and a trumpet. This being understood by all, we proceed to inquire what is the agent in conveying these different sounds to the ear; in what ways it is acted upon in sounds of different loudness, tone, or character; and how far we can explain a most remarkable phenomenon, though not generally believed to be such, on account of the frequency of its occurrence, viz., that we can hear and distinguish, at the same time, almost any number of different sounds. Unfortunately, our knowledge is limited by the nature of the question, which requires the improvement of one of the most difficult branches of mathematical analysis; and by our very imperfect knowledge of the constitution of matter, and the effect which putting in motion some particles of a body has upon the rest. Strictly speaking, we ought to say that sound has no existence except in the ideas of the hearer; but, in accordance with common phraseology, we shall speak of a body as *sounding* when it is in that state in which it would produce the impression of sound, if the proper medium were placed between it and the ear.

No body can produce a sound, as we know from observation, unless its parts be put into rapid motion. We have evidence of this in a tuning fork, the string of a musical instrument, the parchment of a drum, &c. Neither will any sound be perceived unless there is a continual supply of solid or fluid matter, possessed of a moderate degree of elasticity, between it and the ear. Thus a bell, when rung in an exhausted receiver, hardly yields any sound; and the small portion which it does give may be altogether destroyed or materially diminished by lining the receiver with cotton or wool. The air is generally the medium through which sound is conveyed; but only because this is most commonly the one with which the *tympanum* or drum of the ear is in direct communication. A bell rung under water has been very well heard at a distance of 1200 feet by an observer with his head under the same body of water; those who work in one shaft of a mine can often distinctly hear the sound of the pickaxe in another shaft through the solid rock; and persons wholly deaf, who therefore are not at all affected through the ear, have received pleasure from music, by placing their hands upon a shutter or other solid body near the instruments. We confine ourselves particularly to what takes place in air.

The body of air which surrounds us produces no sound if it be all moved together, that is, if the velocity of all its particles be the same. The highest wind makes no noise except when it is forced against some obstacle, and the sound of a cannon is heard in whatever direction the wind may blow. Neither does the strongest band of music produce any sensible wind in any direction. It is therefore unto some other sort of motion that we must look for the agent of sound, and the manner in which sonorous bodies move immediately points it out. If a tuning fork or a string be struck, a rapid succession of vibrations is the consequence, which, as we shall see, causes the particles of air to vibrate in a similar manner. And we find, that in order to produce a note, not only must there be a succession, but a *rapid* succession, of vibrations; experiments show that the ear is not capable of receiving the impression which we call sound, unless the particles of air in contact with it vibrate at least thirty times in a second. The vibration produced in the particles of air by a sonorous body may be distinctly proved by the following experiment. Let a tuning fork be sounded, and while yet in vibration, let it be stopped by the finger. A sensation will be felt for an instant, for which we have no name in our language, arising from the prong of the fork rapidly, but gently, striking the finger, and very different from that produced by merely touching the fork when at rest. Now, blow into a common flute, stopping two or three of the higher holes, gently. The same sort of sensation, though in a much smaller degree, will be felt on that part of the fingers' ends which is in communication with the interior air. The fingers should be warm, and if the observer be not used to the instrument, the effect is made more certain by tuning the string of a violoncello to the note which is to be fingered on the flute, and then sounding the former strongly, while the latter is held over it, with the fingers placed as before. That any very violent and sudden noise produces a concussion in the air even farther than the sound can be heard, is proved by the fact, that the explosion of a large powder-mill will shake the windows in their frames for nearly twenty miles round.

We now proceed to describe, as far as the same can be simply done, the motion which takes place in the air when the impression of sound is communicated; and here we stop to explain a method of making the eye help the reason in many cases. Suppose we wish to register what takes place in the vibration of a spring, of which the position of rest is AB, but which, having been set in motion, (*Fig.* 1,) passes through all positions between AC and AD. The spring being at AC, and the finger or other disturbing cause being removed, the elasticity of the metal makes continued efforts to restore it to its first position AB, by which it is made to move, and with continual accession to its velocity, until it actually does arrive at AB where, if the velocity were suddenly destroyed, it would rest. But the velocity still continuing, the spring continues to move towards AD, with a change of circumstances, inasmuch as the elasticity, now opposing its motion, gradually destroys the velocity by the same steps as it was before gradually created; so that when the spring comes to AD, it will be again at rest, but will not continue so, since the elasticity will cause the same phenomena to be repeated, and the spring will move back again towards AC. But for friction and the resistance of the air it would again reach AC; it does not, however, get so far, owing to these causes, which always diminish, and never increase, velocity. This alternation will go on until the spring is reduced to a state of rest. Similar phenomena occur in the motion of a pendulum, of the string of a harpsichord, and generally, wherever small vibrations are excited in a body, which remove it, but not much, from its position of rest. We might, perhaps, conclude, that each successive oscillation is performed in a shorter time than the preceding, seeing that a less space is described by the spring. But this is not the fact: it can be observed, as well as demonstrated, that the oscillations which take place before a body recovers the effects of a small disturbance and resumes the state of rest, are severally performed, if not in the same time, yet so nearly in the same time, that the difference may be entirely neglected in most practical applications: for the reason of which, see Oscillation. Such being the case, we may omit the effects of friction and resistance, so far as the *time* of vibration is concerned, and consider the spring as describing exactly the same path in each successive vibration. Let DC be the line described by the top of the spring, which we may call a straight line, since it is very nearly so, and while the spring moves from D to C, imagine a curve DyC to be drawn, in such a way that, the spring being at x, the perpendicular xy is the rate per second at which the top of the spring is then moving. A little attention will show that the curve we have drawn represents the various changes of motion just alluded to: thus TB, the greatest perpendicular, is over the point B where the spring moves fastest; and at D and C there is no perpendicular, the spring coming to rest when it reaches those points. During the return from C to D, in which the motion is the same, but in a contrary direction, let a similar branch CtD be drawn, on the other side of CD. We will call the whole curve DTCtD the *type* of the double vibration of the spring, the two branches being the types of its two halves. Now, suppose a column of air inclosed in a thin tube AB, which is indefinitely extended towards B, but closed at A by a piston which moves backwards and forwards from A to C, and from C to A, after the manner of a spring, the type of its motion being represented by the curves on AC. And first let the piston be pushed forward from A to C. If the air were solid, we should say that a column of air AC in length would be pushed out of the end B of the tube (*Fig.* 2.), in the time in which the piston is driven in. As to how far we should be justified in saying so, we refer the reader to the article Elasticity; we certainly can have no notion that such an effect would be produced upon a column of elastic fluid like the air. Experiment, as well as mathematical demonstration, show us that though every particle of the fluid will finally be put in motion, yet that those particles which are nearer the disturbing piston receive their first impression sooner than those which are more distant; and we find that this successive *propagation*, as it is called, of the disturbance, goes on *uniformly* at the rate of about 1125 feet in a second, the temperature being 62° of Fahrenheit; for example, a second must elapse before those particles, which are 1125 feet distant from A, will have their first news, so to speak, of what is going on at A, and in the same proportion for other distances. It is also shown that the velocity of communication is not affected by the greater or less degree of violence with which the air is struck, but remains the same for

Fig. 1

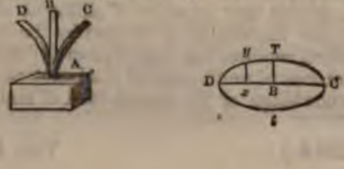
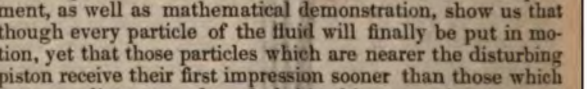
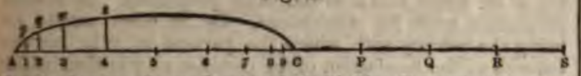


Fig. 2



every sort of disturbance. With such a velocity, we may see that the column of air made up of all the particles which feel, or have felt, the effects of the disturbance, must be very long when compared with A C, the extent of an almost insensible vibration; so that it will lead to no sensible error if we suppose that the effect of the piston at every point of its course is propagated instantaneously to C, and from *thence* only, with the velocity of 1125 feet per second. We will now consider what this effect is. Divide the whole length A C, *fig*. 3, into a large number of very small parts, *described in equal parts*, and instead of the piston moving continuously, and with imperceptible changes of velocity, along A C, let it move by starts from each point to the next, with the proper increase or decrease of velocity. In the figure we have divided A C into ten parts, but the same reasoning applies to any greater number, and the reader may refer to ACCELERATION for an instance in which the truth, as regards motion gradually increased, is come at by a similar supposition. We have much enlarged A C (*Fig*. 3), to give room for the figure: the reader may help his ideas by supposing that A C is viewed through a powerful microscope, and the rest of the tube by the naked eye. Whatever may be the common time of moving through each of the parts A 1, 1 2, &c., the portions of the column affected by the starts of the piston will be of the same length, and each will be as much of 1125 feet as the time of each start is of one second. Set off the lengths C P, P Q, Q R, &c., each equal to this length, and for the present let us agree to call the common time in which the piston starts through A 1, 1 2, &c. an *instant*. The reader must bear in mind throughout that we intend to carry the supposition of dividing A C into parts to its utmost limit, by which we shall have to suppose C P, P Q, &c. very small, though still great when compared with A 1, 1 2, &c. We also think it right to repeat, that all the figure on the left of C is immensely magnified, and that the propagation is supposed to be instantaneous from 1, 2, &c. to C. In the first *instant*, the piston moves through A 1, with the velocity *p* 1 per second, and forces the column of air A 1 into C P, which, therefore, has its density increased, or is compressed, the air which was held in C P and A 1 together being now confined in C P. As the propagation has not travelled farther than P, the effect is just the same as if there had been a solid obstacle at P during the first instant. The portion C P is then compressed, strictly speaking, *unequally*, that is, the parts near to C are more compressed than those near to P; but on account of the small length of C P, and the rapidity of the transmission, we may suppose all the parts equally compressed. Again, the particles near C begin to move towards P, and for a similar reason we may suppose the velocities of all the particles the same; this velocity being that of A during the first instant. The reader must not confound the absolute velocity of the several particles, which is always small, with the rate at which they transmit their velocities and compressions, which is very great. We will use the phrase that the portion C P has received its *first compression*. If the piston were stopped at the end of the first instant, the whole effect upon C P would be transferred to P Q in the second instant, both as to compression and velocity, and the particles of C P would return to their first state, and receive no further modification. But in the second instant, the portion C P receives its *second compression*, which is greater than the first, since a column 1 2 longer than A 1 is forced into it. Similarly the velocity is increased, being 2 *q* per second instead of 1 *p*. If the spring were then stopped, the third instant would see the portion P Q transmit its velocity and compression to Q R, C P to P Q, and C P would resume its natural state. But in this instant, C P receives its third compression, which is greater than the former two, and the same process goes on, each portion transmitting its velocity and compression to the *succeeding* one, receiving in its turn more than it parted with, from the *preceding*. This continues until the piston has reached the middle point of A C, after which the compression of C P still continues, but becomes less and less in successive instants, because 5 6, 6 7, &c. down to 9 C decrease in length, in the same way as A 1, 1 2, &c. increased. When the piston begins to return through C 9, in the eleventh instant, the portion C P receives its *first rarefaction*; for the air in C P now occupies C P and C 9; the particles in C P therefore move towards C instead of from it, and the preceding modifications are successively repeated in *quantity*, but changed into their contraries; that is, each portion undergoes successive rarefactions, equal in amount to the former condensations, and the particles move *towards* C with the same velocities which they formerly had *from* C. This continues until the piston reaches A again, after which the same phenomena recommence in the same order. Thus it appears that the absolute velocity of each particle is in the direction of the propagation so long as it is compressed; but in the contrary direction, when it is rarefied, and that each particle, during the progress of a double series of compression and rarefaction, moves forward in the direction of propagation, and back again to its former place, where it rests, unless a third vibration follows the first two. When we talk of the compression of a particle, we mean that it is nearer the succeeding particle, than it would have been in its natural state; and *vice versâ* for rarefaction. We may represent these phenomena in the following table, which, to save room, is made on the supposition that A C was divided into four parts, and might be equally well constructed if the number of parts into which A C was divided had been greater. The numbers in the top horizontal line are the successive portions of the tube, those in the left vertical column the successive instants of time, and under any portion of the tube, opposite to any instant of time, will be found the state in which that portion of the tube is at that instant of time: 1 denoting its first compression; 1′ its first rarefaction; these latter numbers recommencing when a complete cycle of changes is finished. The blanks denote that the effect has not yet reached the corresponding particles.

Fig. 3.

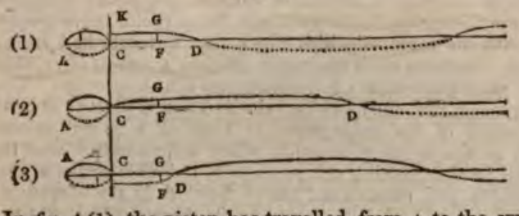


	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	1															
2	2	1														
3	3	2	1													
4	4	3	2	1												
5	1′	4	3	2	1											
6	2′	1′	4	3	2	1										
7	3′	2′	1′	4	3	2	1									
8	4′	3′	2′	1′	4	3	2	1								
9	1	4′	3′	2′	1′	4	3	2	1							
10	2	1	4′	3′	2′	1′	4	3	2	1						
11	3	2	1	4′	3′	2′	1′	4	3	2	1					
12	4	3	2	1	4′	3′	2′	1′	4	3	2	1				
13	1′	4	3	2	1	4′	3′	2′	1′	4	3	2	1			
14	2′	1′	4	3	2	1	4′	3′	2′	1′	4	3	2	1		
15	3′	2′	1′	4	3	2	1	4′	3′	2′	1′	4	3	2	1	
16	4′	3′	2′	1′	4	3	2	1	4′	3′	2′	1′	4	3	2	1

On casting the eye down any vertical column, we see the state of the same portion in successive instants of time: on looking along a horizontal column, we see the state of all the portions of the tube at the same instant, as far as the effect has reached them. Doing the latter, we see that all the successive states are continually repeated, in such a way that whatever states two portions may be in, the intermediate portions have all the intermediate states. There is also at the beginning an unfinished series in process of formation. If we look down a column, we see that any one particle successively undergoes the different states, from the moment when the effect first reaches it. We shall now suppose the division of A C to go on without end, and examine the final result. The different states of compression or rarefaction will then become more and more numerous, but the difference of quantity between each and its preceding will become less and less, so that when we at last give to the piston a *continuous* or gradually increasing and decreasing velocity, we must also suppose a continuous or gradually increasing and decreasing compression or rarefaction of the air in the tube. This being premised, we return to the figure, and construct the *type* of the motion of the piston, both backwards and forwards, and also the *type* of the state in which the particles of air actually are for two or three several positions of the spring;

as in the figure below, which we proceed to explain. (*Fig.* 4.)

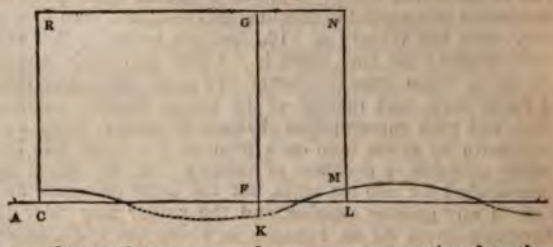
Fig. 4.



In *fig.* 4 (1), the piston has travelled from A to the small perpendicular, through something more than a quarter of a vibration: the first disturbance has reached D, and the curve D K is the *type* of the state of each particle as to velocity; that is, the perpendicular F G is the rate per second at which the particle F is moving from C, and the same for every other perpendicular.

If the piston be performing its third complete vibration, or its second vibration *forwards*, there will have been a preceding series of compressions and rarefactions propagated onwards, as in the figure 4 (1). In *fig.* 4 (2), a vibration forwards has been completed; the curve on C D now represents a complete undulation, as far as the compressions are concerned. In *fig.* 4 (3), the return of the piston has commenced, and the particles between C and D are rarefied, and moving towards C; this we explain by placing the *type* beneath the tube, and dotting the curve; F G expressing the velocity per second of the particle F towards C. The length of the whole wave C D is easily calculated. If, for example, the single vibrations of the piston are made in $\frac{1}{100}$ of a second, the first impulse will have travelled through one hundredth part of 1125 feet, or 11¼ of a foot. This is the length of C D, in *fig.* 4 (2). The complete series of compressions is called a *wave of compression;* and that of rarefactions a *wave of rarefaction.* And the same type which represents to the eye the velocities of the various particles, will also serve to represent the degrees of compression or rarefaction. For those particles which are moving quickest from C are most compressed, and those which move quickest towards C are most rarefied. In returning to figure 3, we see that A 1, 1 2, 2 3, &c., are spaces described in equal times, and are therefore in the same proportions as the velocities, that is as 1 *p*, 2 *q*, 3 *r*, &c. But these spaces, in the preceding explanation, are proportional to the degrees of condensation; these latter then are proportional to the velocities. If, then, we suppose the series of compressions and rarefactions to have gone on for some time, and an unfinished wave of compression to have been formed at the instant we are considering, we may represent the whole state of the particles in the tube at that instant by the following figure—(*Fig.* 5):—R G N is a line parallel to the tube, and therefore G F is of the same length for all positions of F. It is to be made 1125 feet in length. Its use depends upon the following proposition:—That in the simple undulation which we are now considering, so long as the disturbance is small, the velocity of any particle bears to the *velocity of propagation* (two very distinct things, as we have before observed) the same proportion as the change in the density bears to the density of undisturbed air. This follows from the investigation attached to *fig.* 3: for, in the fourth instant for example, the column 3 4 of air is forced into C P, and 3 4 and C P being spaces described in equal times with velocities

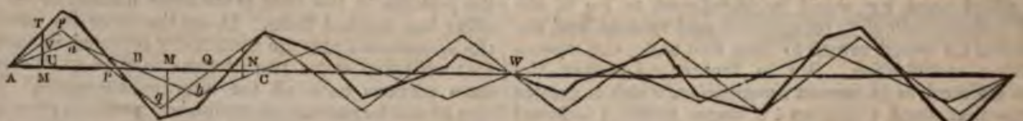
Fig. 5.



4 *s* and 1125 feet per second, are spaces proportional to these velocities. And the compression will be the same if we increase C P in any proportion, provided we increase the quantity of air forced into it in the same proportion. A similar proposition holds for rarefactions. Or, in other words, F K being the velocity with which the particle at F is moving *towards C*, the rarefaction of the particles at F is that which would be obtained by allowing the air naturally contained in a tube G F, 1125 feet long, to expand into the length G K. Similarly, the compression at L is that which would be obtained by compressing the air in a tube N L into the shorter tube N M. If we wish to see the state of these particles at any succeeding instant, let the *curvilinear* part of the figure travel uniformly forward at the rate of 1125 feet per second, new curves being continually formed and finished at C: we shall thus have the state of the whole tube at any succeeding moment. Before proceeding to apply this explanation to the phenomena of sound, we must see what will take place if the tube be agitated by several different undulations at once.

All readers, however little acquainted with Mechanics, are aware, that if a body be impressed by two forces in the same direction, it will proceed with the sum of the velocities produced by the two forces; and with the difference of the velocities, if the forces strike in contrary directions, the motion in the latter case being in the direction of the greater of the forces. Hence, if there be different undulations excited in the same column of air, the velocities of each particle will be made up of the *sum* or *difference* of those which it would have received from each undulation, had each acted alone; the *sum* when it would have been compressed by both, or rarefied by both, and the *difference* when it would have been compressed by one and rarefied by the other. And the compressions or rarefactions being proportional to the velocities, a similar proposition will hold of them. Underneath we have represented the state in which a column of air would be at a given instant from two different waves, the types of which are drawn, and the broad line is the type of their united effects. We know [see INCOMMENSURABLE] that any two lengths are either in the proportion of two whole numbers, or if not, two whole numbers can be found, which are as nearly proportional to them as we please. We have, to take a simple case, drawn the lengths of the waves in the proportion of 5 to 4. (*Fig.* 6.)

Fig. 6



The types of the waves are different portions of straight lines, one whole condensation and rarefaction taking place, as indicated by A *a* B *b* C in the first, and by A *p* P *q* Q in the second. We suppose the waves to commence together. This supposition, of the condensation and rarefaction proceeding in such a way that their types shall be parts of straight lines, is not to be obtained in practice, since, as we have seen, such motion as that of a spring, and we may add of a string or drum, would produce regular curves. But it is as allowable in illustrating the effects of combined undulations as any other; and if, moreover, we round the corners of the types of the single waves, thus making them present an appearance similar to that in the preceding figures, a slight rounding of the corners of the broad line will show sufficiently well what the combined wave would have been, if the preceding figures had been rounded. And the supposition of rectilinear types facilitates the drawing of such figures, (which we would recommend to our readers,) since, as they will observe, the type of the combined wave consists also of portions of straight lines which break off only when the type of one of the single waves changes from one line to another. The general rule for forming the broad line, derived from a preceding observation, is —let the perpendicular or ordinate [See ABSCISSA] be the *sum* of the perpendiculars of the types of the waves, when they fall on the *same* side of A P, and the difference when they fall on different sides; observing, in the latter case, to let the broad line fall on the side of that wave which has the greatest perpendicular. Thus at the first M, M T is the sum of M U and M V, and particles at M are in a greater state of compression than the first wave would give them, which arises from the second; similarly at the second M there is an increase of rarefaction. At N, the air is compressed by one wave, and rarefied by the other, but more compressed than rarefied. At P, B, Q, C, &c., where one of the waves causes neither compression nor rarefaction, the broad line coincides with the other wave.

On looking at the figure thus produced, we see—

1. That it is composed of a cycle of successive compressions and rarefactions, in which, however, the rarefactions differ in kind from the preceding compressions; so that we must not give the term *wave* to each set of compressions or rarefactions, as we reserve this word to denote cycles of changes, which are following by similar cycles of contrary changes.

2. That when the lengths of two waves are as five and four, four of the first will be as long as five of the second; so that the waves recommence together at W, but not exactly as before, the wave of condensation from the first being accompanied by the wave of rarefaction from the second. This difference, however, is not found at the end of the second similar cycle of four and five; so that after eight of the first waves, corresponding to ten of the second, the combined wave begins again to have the same form as at first.

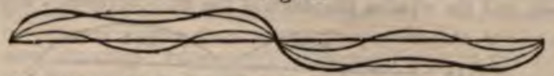
3. The complete cycle denoted by the broad line may be divided into two, joining at W; in the second of which a series of rarefactions is found similar to every series of compressions in the first, and *vice versâ*. We may, therefore, give the name of wave to the part of the broad line intercepted between A and W, consistently with our definition of this word.

4. If the waves had not begun together, a wave would have resulted of the same length as the preceding, if we began at any point where the compression from one was exactly compensated by the rarefaction from the other.

5. If both waves had been of the same length, the resulting wave would have had that length; or if the first wave had been contained an exact number of times in the second, the resulting wave would have been of the length of the second.

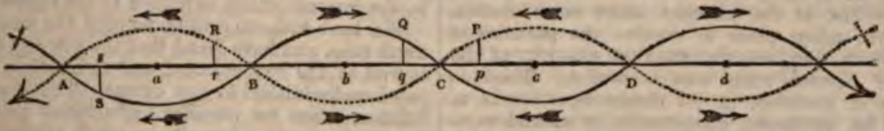
We subjoin a cut, representing a wave contained three times in another wave, and the resulting wave. (*Fig.* 7.)

Fig. 7.



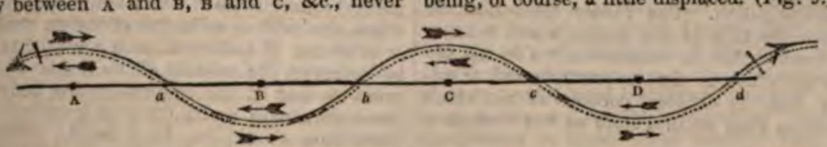
We have hitherto considered combined undulations as propagated in the same direction: let us now take two waves of equal lengths propagated in opposite directions, arising, as we may suppose, from two pistons, one at each end of the tube. After a certain time, depending on the length of the tube, two waves will meet, by which we mean that the particles will begin to be affected by the motion of both pistons, and the manner in which the joint effect is represented is the same as before, though the phenomena are very different. In the former case, having represented the resulting wave at one instant, we could trace the change of state throughout every particle of the fluid, by supposing the type of that resulting wave, or a succession of such types, to move along the tube at the rate of 1125 feet per second; in the present case, the waves are propagated in contrary direction, so that any given effect from the first wave is no longer continually accompanied by another given effect from the second wave. We must also recollect, that the motion of the particles in each wave of compression is in the direction of the propagation; so that a particle under the action of two waves of compression, has opposite velocities impressed upon it, and therefore moves with the difference of the velocities; and so on.

Fig. 8.



Now let A, B, C, D, &c., be the points where the two series of waves meet in the axis, and let us choose the instant of meeting for the time under consideration. Let the continued line represent the waves propagated from left to right, and the dotted line those propagated from right to left, as marked by the arrows at the parts at which they end; the arrows above them representing the directions of the absolute velocities which the waves over which they are placed give to the particles. (*Fig.* 8.) All the particles are now neither compressed nor rarefied; for it is evident that, whatever condensation or rarefaction a particle experiences from the wave moving to the right, there is a contrary rarefaction or condensation from that which moves to the left. But every particle has the velocity derived from either wave doubled by the other. Again, the particular points A, B, C, D, &c., are never put in motion; for it is plain that by the time any point P comes over C, giving it the velocity of P*p* to the left, the point Q, similarly placed on the other wave, will also have come over C, giving it the equal and contrary velocity Q*q*; so that, as far as velocity is concerned, all the impression produced on A, B, C, D, &c., is equivalent to two equal and contrary velocities, or to no velocity at all. But when P has come over C, the compression, answering to P*p*, is doubled by that answering to Q*q*. So that the particles at A, B, C, &c., undergo no change of place, but only condensation or rarefaction. Also the particles at *a*, *b*, &c., halfway between A and B, B and C, &c., never undergo compression or rarefaction, but only change of velocity. For by the time any point R, from one wave, has come over *a*, with the condensation answering to R*r*, S will have come over it from the other, with the equal rarefaction answering to S*s*; so that the effect of the combined waves upon *a*, is always that answering to equal condensation and rarefaction, or no change at all. But the velocities answering to R*r* and S*s* are equal, and in the same direction; so that the points *a*, *b*, &c., have the velocities which one wave would have given them doubled by the other. Hence at *a*, *b*, *c*, &c., the particles suffer no change of state, but are only moved backwards and forwards. Now, let the time of half a wave elapse, in which case the types of the undulations will coincide, and those parts will be over the capitals on the axis, which are now over the small letters, and *vice versâ*, as in *fig.* 9, where the coincidence is denoted by a continued and dotted line together, the latter being, of course, a little displaced. (*Fig.* 9.)

Fig. 9.



Half a wave since, all compression and rarefaction had disappeared throughout the tube, the velocity of every particle being double that which either wave would have caused. The case is now altered; no particle has any velocity, since there are the signs of equal and contrary velocities at every point of the tube; but every particle is either doubly compressed, or doubly rarefied, except *a*, *b*, &c., which, as we proved, are never either compressed or rarefied. In one more half wave, the phenomena of the first supposition will be repeated; that is, all condensation or rarefaction will be destroyed throughout, the particles, however, being all in motion, except A, B, &c., but in directions *contrary* to those they had at first; while, at the end of a fourth half wave, the phenomena of the second supposition will be repeated, that is, all velocity will be destroyed, the particles being all *condensed* or *rarefied*, according as they were before rarefied or condensed. The reader may easily convince himself of these facts by drawing the corresponding figures. To put the results before the eye, suppose the tube to be of a highly elastic material (thin Indian rubber, for example), so as to bulge outwards a little when compressed from the interior, or to contract in diameter by the pressure of the outward air when the inward is rarefied. Recollect, also, that A, B, C, D, &c., remain without motion, their only change being condensation or rarefaction; while *a*, *b*, *c*, &c., are never compressed or rarefied, their only change being that of place. We exhibit side by side the successive appearances of the tube, and the relative situations of the types between A and C, the arrows always representing the direction of the motion of the particles. A half-wave elapses between each two configurations. (*Fig.* 10.)

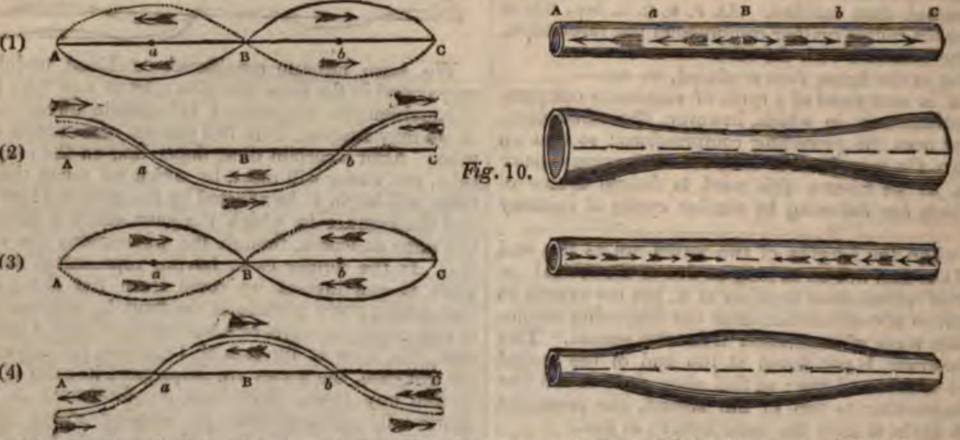


Fig. 10.

These phenomena will recur in the same order, and this mode of undulation, though it is necessary to show how it arises from the combination of two waves, is nevertheless more easy to be explained by itself than either of these two. For if we recollect that when particles of air move away on both sides from a given point, there must be a condensation in the parts towards which they move, and a rarefaction in those which they quit, (2) will evidently follow from (1). At this second period, the elasticity of the air will have opposed and destroyed the velocities of the particles; so that there now only remains a tube of particles at rest for the moment, condensed towards the ends and rarefied in the middle. There will, therefore, immediately commence a rush of air towards the rarefied parts, which will end by producing the state represented in (3), where equilibrium is restored, as far as compression and rarefaction are concerned; but where, at the moment under consideration, nothing has yet taken place to deprive the particles of the velocity which they received from the elasticity of the air before the natural state was recovered. There is now a motion of particles, in all directions, towards B, which will go on producing compression at B, and rarefaction at A and C, until all the velocity is destroyed. This is the state represented in (4), from which (1) follows again; and so on. The states of the column intermediate between the times of (1), (2), &c., are easily imagined. Between (1) and (2) the compression at the extremities will have begun; but not yet to the complete destruction of the velocities. Between (2) and (3) the motion of the particles towards the middle will have begun; but will not yet have placed them in their natural positions; and so on. The particle at B is evidently never in motion, being always equally pressed on both sides. The same would be seen of A and C, if the tube were extended on both sides.

It is evident also, that except at the instant when compression and rarefaction are all destroyed, there must be a point at which the transition occurs from condensation to rarefaction; and *vice versâ*. It is not, however, so evident, in this way of viewing the subject, that these points always remain in the same position at *a* and *b*, which is the result of our previous investigation. The reader must however recollect, that, when we talk of the points *a* and *b* being always free from condensation or rarefaction, we do not say that it is *the same air* which is always uncondensed or unrarefied, but only that the different portions of air, which pass by *a* and *b*, are in their natural state at the instant of the passage.

Now it must be evident, that if, in the motion of a fluid, there be certain particles which remain at rest, it is indifferent whether we suppose those particles to be fluid or solid; for all that we know of a solid, as distinguished from a fluid, is, that the particles of the latter yield *sensibly* to any applied force, while those of the former do not. Hence, when such impulses are communicated to a fluid, that some of its particles must remain at rest, the question never arises, so to speak, as to whether those particles would, or would not, move with the fluid, or resist, if the conditions of motion were so altered, that forces, which did not counterbalance, would be applied to those particles. Let us now suppose that a solid diaphragm is stretched across the tube at A; the motion will still continue exactly as before; and we may produce this species of complex undulation by a piston at one end only of the tube, provided the other end be closed. For, on this supposition, all the successive states into which the air at the end furthest from the piston is brought, cannot be communicated to the outside air, and must, therefore, be either retained, or returned back again through the column of air. The latter effect results; and the returning wave, which is of the same kind as the advancing wave, produces the phenomena just explained. If A and B were both closed during an undulation, no piston would be necessary, if it were not that there is no substance but what will vibrate in some small degree, and the vibrations communicated to the tube from the internal air gradually destroy the internal motion, by the communication of motion to the external air.

We have hitherto considered only the motion of air in a small tube, and have found that the velocity of the particles, as well as the condensation and rarefaction, may be propagated undiminished to any extent. The case is somewhat different when we consider undulations propagated in all directions at once. Imagine a small sphere, which is uniformly elastic in every part, and which, by some interior mechanism, is suddenly diminished in its dimensions, and afterwards as suddenly restored. A wave of rarefaction and condensation will be propagated in every direction; which wave, at any instant, will be contained between two spheres, concentric with the sphere already mentioned, the radii of which differ by the length of the double wave: at least, unless there be some reason in the state of the atmosphere, why the propagation should take place more quickly in one direction than another. We have no reason, at first sight, to suppose that the velocity of propagation would be exactly, or even nearly the same as if a portion of the air through which the waves pass had been contained in a tube, unconnected with the exterior air. But it is found, both by mathematical analysis and experiment, that the velocity of propagation remains unaltered in both cases; and also that the *absolute* velocities of the particles diminish. This last is a natural consequence of a very simple principle—namely, that when one body, or collection of bodies, strikes a larger body, or collection of bodies, in such a way that its whole motion is destroyed, the velocity of the larger body will not be so great as that of the communicating body, but less in the same proportion as its mass is greater. The law of this diminution should be, from theory, *inversely as the distance;* that is, by the time the wave has moved from 3 miles to 5 miles, the compressions and velocities should be as 5 to 3; but we have no direct means of submitting this to experiment, the absolute velocities being imperceptible.

We now proceed to the application of these principles. We know that when the air is violently or rapidly propelled in any direction, that undulations such as we have described are produced, and that the impression called sound is produced also. When a gun is fired, the great elasticity of the gases which are disengaged by igniting the gunpowder, forces the air forward out of the gun, which the instant afterwards is allowed to return. If feathers or dust be floating in the air, they have been observed to move forwards, and then back again, just as we have found the particles of air around them would do in the course of a double wave. The intensity or loudness of the sound seems to depend upon the greatest absolute velocity of the particles, and not at all upon the velocity of propagation, which is found to be the same for all sounds. Thus in a musical chord, spring or drum, the harder the metal or parchment is struck, the louder is the sound, but without any difference of tone, character, or velocity of propagation. There is no instrument of which the sound may not be made louder or weaker without any other change than giving greater velocity to the immediate cause of sound. We will not enter further into this part of the subject than to observe, that, generally speaking, we are not authorized to say that sound travels with equal loudness in all directions. It might do so in the case where it was communicated by the sudden contraction and expansion of an elastic sphere, as above supposed; but this is a supposition which we cannot put in practice. If a tuning fork be sounded and turned round in the hand while held up before the ear, very perceptible diminutions and augmentations of loudness will be perceived.

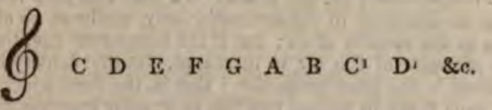
The immediate communicator of sound is the tympanum or drum of the ear, an elastic membrane, which is set in vibration by the motion of the particles of air against it, and vibrates in the same time with them. The impression is conveyed to the brain by certain neighbouring nerves. [See Ear.] We might expect, that when the wave of sound is of considerable length, we should hear its different parts, that is, feel a difference between the beginning and end where the velocities and compressions are small, and the middle where they are greatest. This happens to a small extent, in the difference, for example, between the 'roar' of a cannon and the 'report' of a musket. No explanation can convey a better idea of the difference than these two words. These simple uncontinuing sounds are the result of few waves, there being no cause for their continuance.

We have not room in this article for any discussion of the manner in which sounds are conveyed through other bodies besides air, for which see Vibration. Noises conveyed through solid bodies travel generally quicker and are heard better; the scratch of a pin may be distinctly perceived through a long spar of wood, though inaudible by the person who makes it. With regard to gases, both theory and experiment agree in enabling us to assert, that any two of the same pressure and temperature, (that is, in which the barometer and thermometer would stand at the same height,) convey sound with velocities which are inversely as their densities. Thus, air being about thirteen times as heavy as hydrogen, the velocity of propagation in the latter is about thirteen times that in the former. Such a result cannot be directly submitted to experiment; but, as we shall see in the article Pipe, there are methods equally certain for ascertaining the truth.

The velocity of sound had been determined by experiment before the time of Newton, who gave the first mathematical solution of the question, with the following result: that if the atmosphere, instead of decreasing in density as we ascend it, were all to be reduced to the density at the earth's surface, but to be so diminished in height, that the pressure at the earth's surface should not be altered, the velocity of propagation would be that acquired by a heavy body falling unresisted from half the height of this *homogeneous atmosphere*. This reasoning, however, gave the velocity nearly *one-sixth* too small; and the cause of the difference was afterwards supplied by the sagacity of Laplace. This we shall try to explain. We know that air and all gases resist compression, and will expand themselves if the pressure of the superincumbent atmosphere be removed. This tendency is what we mean by the *elastic force* of the air or gas. If we take a column of air reaching from the earth's surface to the top of the atmosphere, the elastic force at any one stratum is equal to the weight of the superincumbent column, since it balances that weight. Moreover, it is observed, that, *at the same temperatures*, the elastic forces of two different strata are as their *densities*, that is, for air of half the density of common air, the elastic force is only half as great, and so on. It is also observed that any increase of temperature increases the elastic force if the density remain the same, and also that compression always increases the temperature; and *vice versâ*. If, therefore, a vessel of air were pressed into half its dimensions, it would double its elastic force from the condensation, which would also receive a further addition from the increase of temperature. Again, if the same were rarefied into double its first dimensions, the elastic force would be halved by the rarefaction, and receive a further decrease from the diminution of temperature. The increase or decrease arising from temperature would not last long, since the altered mass would communicate heat to the surrounding bodies in the first case, and receive it from them in the second; but in calculating such instantaneous effects as the propagation of sound, it is evident they ought not to be neglected. The supposition on which Newton went was, that the elastic forces of two strata of air are always in the same proportion as their densities, which is not true, unless the temperatures are the same. We may also here remark, that an alteration in the *barometer* only, produces no alteration in the velocity of air; for, if the barometer rise, though the pressure of the air is increased, yet the density is increased in the same proportion; that is, the force which is to set each mass in motion receives no greater increase in proportion than the mass which is to be moved. But a rise in the thermometer, accompanied by no change in the barometer, increases the velocity of sound, for there is an increase in the elastic force, without any increase in the density. A very good measure of this velocity made near Paris in 1822, under the directions of the Academy of Sciences, gave 1118 feet per second at the temperature of 61° of Fahrenheit. Earlier experiments had given 1130 feet, which, if the French measure is assumed as accurate, represents the velocity at a somewhat higher temperature. The number which we have adopted, viz., 1125 feet per second, at 62° of Fahrenheit, is shown by Sir John Herschel, in his masterly treatise on 'Sound' in the *Encyclopædia Metropolitana*, to accord very nearly with the mean of the best experiments. Every increase or decrease of temperature of 1° of Fahrenheit, causes a corresponding increase or decrease of $1\frac{14}{100}$ of a foot in the velocity of sound, which gives about 1090 for the velocity when the air is at the freezing point. We may add, that in the present state of our knowledge of the manner in which the temperature and elastic force of the atmosphere are connected, observation and theory give results which differ from one another by about a hundredth part of the whole.

When the exciting cause of sound is continued, as for example, when a board is scratched with a pin, we have a continued sound, caused by the succession of waves which the ear receives, which waves we have no reason to believe are all of the same length. But whenever the exciting cause is one, the vibrations of which can be shown to be performed in exactly the same time, so that the waves caused by them are all of the same length, we perceive a sound which gives pleasure to the ear, and has the name of *harmonious* or *musical*. This, however, only happens when the vibrations are at least thirty in a second, or the wave of a sound at most about 38 feet long. This fact is so well established, that we may consider it as certain that the pleasure arising from musical sounds is a consequence of the perfectly equal times of the vibrations which produce them, and of its result, the equal lengths of the sonorous waves propagated from them through the atmosphere. This will not appear so extraordinary, if we consider the very delicate nature of our organ of hearing. A person of tolerable ear can distinguish between two sounds, which only differ in that the one is a consequence of 400 vibrations in a second, and the other of 405. We must therefore grant to the ear a much higher power of perception as to sounds than the eye has as to length or surface. Some increase of the perceptive power may arise from the very great number of vibrations, since a result in some degree corresponding is observed in vision. If we look at a large number of parallel lines ruled close together at equal distances, any little deviation from parallelism or equidistance is much more sensibly seen than when the number of lines is small. And even to the eye, any moderately rapid succession of objects of the same kind is much more pleasing when they follow at equal distances and periods of time.

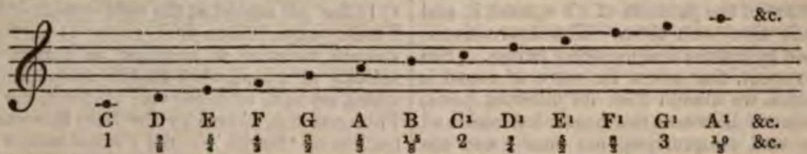
The difference between two musical sounds, which we express by saying that one is higher or lower than the other, is a consequence of the different number of vibrations performed by the two in the same time, and the sound which we call *higher* has the greater number of vibrations. And some sounds, when made together, produce an effect utterly unbearable, while others can be tolerated; others again are extremely pleasant, while some, though very different in pitch, appear so alike, that we call them the same, only higher. It is found by experiment that two sounds are more or less *consonant*, when heard together, according as the relation between their vibrations is more or less simple. Thus, when two vibrations of the first are made in one vibration of the second, (which is the simplest ratio possible, when the sounds are really different,) that similarity is observed to which we have just alluded; the first sound is called the octave of the second, and both are denoted in music by the same letter. When the number of vibrations of the two are as 3 to 2, the one which vibrates three times while the other vibrates two, is called a *fifth* above the other; because in the musical scale of notes



the vibrations of C and G are in this proportion, and G is the *fifth* sound reckoned from C. If the ratio of the vibrations be that of 3 to 4, that is, if the higher note makes four vibrations, while the lower note makes three, which is the case with C and its *fourth* F; or that of 4 to 5, which happens with C and its *third* E; the combined effect of the two is agreeable. The same may be said of C and its *sixth* A, in which the ratio is that of 3 to 5, or of E and its *minor sixth* (see MUSIC) C^1, in which the ratio is that of 5 to 8; or of E and its *minor third* G, in which the ratio is that of 5 to 6. We write underneath, the common musical scale in the treble clef, with the denominations of the notes and the fraction of a vibration which is completed, while the first C completes one vibration, which fraction is greater than unity, as the notes are rising. Thus while C vibrates once, D vibrates once and one-eighth; or 8 vibrations of C take place during 9 of those of D.

This is the musical scale pointed out by nature, since all nations have adopted it, or part of it at least. It fully verifies our assertion that the ear delights in the simplest combinations of vibrations. It would be hardly possible to place between 1 and 2, six increasing fractions where numerators and denominators should, on the whole, contain smaller numbers. We find, in the six intermediate fractions, only 2, 3, 4, and 5 singly, or multiplied by one another, no product exceeding 15. Neither has the whole of this scale always been adopted. It seems to have been formerly universal to reject F and B, the *fourth* and *seventh* of the scale; as is proved by the oldest national airs of the orientals, the northern nations, and even of the Italians. [See SCALE.]

Fig. 11.


&c.
C D E F G A B C¹ D¹ E¹ F¹ G¹ A¹ &c.
1 9/8 5/4 4/3 3/2 5/3 15/8 2 9/4 5/2 8/3 3 10/3 &c.

The following table will represent the proportions of the lengths of the sonorous waves which yield the preceding notes. These lengths decrease, as we have seen, as the *times* of vibration *decrease*, or as the numbers of vibrations in a given time increase.

Now, let two of these notes be sounded together, for example, C and G, in which two waves of C are equivalent to three of G. The resulting wave is, as we have seen in the preceding part of this article, twice as long as the wave of C, and the curve which represents the condensation and velocity of the particles of air is compounded, as before described, of those of the waves of C and G. The ear is able to perceive three distinct sounds, one of which is almost imperceptible, and indeed inaudible, unless carefully looked for. The two perceptible sounds are those of C and G from which the wave was made; nor are we well able to explain how this can be. Undoubtedly, if the curve, which is the type of the compound wave, were presented to a mathematician, he would be able, with consideration and measurement, to detect its elements; and to make that resolution which is done by the most unpractised ear. But we may, perhaps, assert that a savage, or a person totally unused to music, would not separate the sounds, but if C and G were sounded separately, and afterwards together, would imagine he had heard three distinct notes. The third sound, which is very faint indeed, is that belonging to the whole compound wave, which, being twice as long as the wave of C, belongs to the note called C, an octave below the first C of the preceding scale, which may be denoted by C$_1$. We may perhaps give an idea of this combination in the following way:—Let us suppose a series of equidistant balls to roll past us at the rate of two in a second, and another series at the rate of three in a second,—and let us moreover suppose that these balls roll in tubes placed one over the other, so that we only see each as it passes an open orifice in its tube, as in the figure.

Fig. 12.

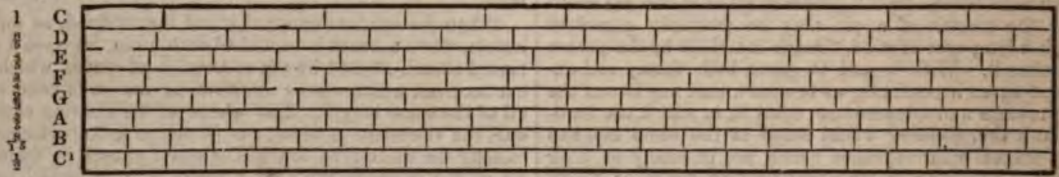
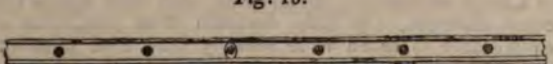


Fig. 13.



It is evident that we thus obtain three distinct successions: 1, that by which we might count 3 in a second from the lower tube; 2, that by which we might count 2 in a second from the upper tube; 3, that by which we might count single seconds, from observing when two balls pass together, and waiting till the same happens again. And we must recollect that any sound, however unmusical in itself, produces a musical note, if it be repeated regularly and often; so that it is not from the phenomenon itself, but from the frequency of its succession at equal intervals, that the pleasant sensation is derived. Thus in a passage, which has a strong echo, that is, where waves are reflected from wall to wall, as in the tube closed at both ends, already described, if the foot be struck against the ground, a faint musical note is heard immediately after the echo has ceased. By the action of the foot, shorter waves are excited, as well as the long wave, by the reflection of which the echo is caused. None of these would be repeated were it not for the reflection; but when the main sound is weakened by reflection, the shorter waves begin to produce the effect of a musical note, being, as we must suppose, less weakened than the longer wave. And we may here take occasion to observe, what will be further discussed in the articles PIPE and CHORD, that it is difficult to excite a perfectly simple wave, unaccompanied by shorter ones, which latter are always contained an exact number of times in the longer. Thus, if the note called C$_1$, or an octave below C in *fig.* 11, be struck on a piano-forte, the sounds G and E^1 (see the figure) will be distinctly heard as C becomes weaker, the waves of these notes being respectively one-third and one-fifth of those of C. When two notes are struck together, the effect is not pleasing, except when the numbers of waves per second in the two bear a very simple proportion.

We have noticed all the cases which the musicians call *concords*; the remainder, though contributing much to the effect of music, being called *discords*. Thus, if F and G be sounded together, in which (*fig.* 11) F makes $\frac{4}{3}$ of a vibration while G makes $\frac{3}{2}$, or F makes 8 vibrations while G makes 9, the effect is disagreeable, at least if continued for some time. On the piano-forte, in which the notes when struck subside into comparative weakness, this is not so much perceived; but on the organ, in which the notes are sustained, the effect is intolerable, and accompanied by an apparent shaking of the note, producing what are called *beats*, which we shall presently explain. Nevertheless, it becomes endurable, if not too long continued, provided F, the *discordant note*, as it is called, is allowed to pass to the nearest sound, which will make one of the more simple combinations of vibrations with G. The nearest such sound is E, which makes 5 vibrations, while G makes 6. For further information, we must here refer to the article HARMONY.

We now come to the absolute number of vibrations made by musical notes; all that we have said hitherto depending only upon the proportions which these numbers of vibrations have to one another; so that any sound might be called C, provided the sound produced by twice as many vibrations in a second were called C¹, and so on. We do not know that any measurements have lately been made in this country, but, from the Memoirs of the Academy of Berlin for 1823, it appears that the middle A of the treble clef, or the A in *fig.* 11, was produced by the following numbers of waves per second in the following different orchestras, showing a *small* variation between them, but one by no means insensible to the ear.

Theatre at Berlin - - - - - -	$437\frac{32}{100}$
Paris, French Opera - - - - -	$431\frac{34}{100}$
— Comic Opera - - - - -	$427\frac{61}{100}$
— Italian Opera - - - - -	$424\frac{17}{100}$

From this we may form an idea how many vibrations are necessary to create the sensation of a musical sound, and also at what point of the scale the vibrations per second would become so numerous that this effect should cease. If we take one of Broadwood's largest piano-fortes, and recollect that they are generally tuned (for private purposes) a little below the pitch of the orchestra, we shall not be far wrong in assuming that the A above-mentioned on these instruments is the effect of 420 vibrations per second. The lowest note, which is almost inappreciable (that is, though perfectly audible as a sound, yet hardly distinguishable from the notes nearest to it), is the fourth descending C from this A, and the highest is the third F above it, though the C above that, or the *fourth* ascending C from the A, can be well heard, and may be had by whistling into a very small key. We must however remark, that the point at which a series of undulations ceases to give a sound either from its slowness or rapidity, is different to different ears; sometimes so much so, that while one person complains of a note as too shrill, another cannot hear it at all. We write the above scale below, putting the A, whose vibrations we know, in its proper place,—

$C_3 \quad C_2 \quad C_1 \quad C \quad A \quad C^1 \quad C^2 \quad C^3 \quad C^4.$

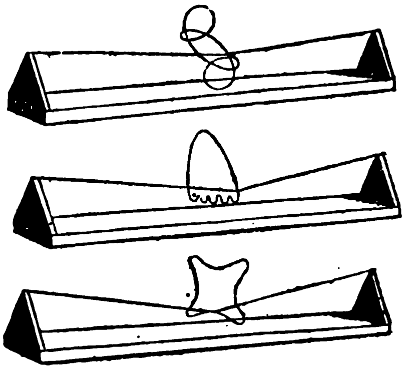
On looking at *fig.* 11, we see that A makes 5 vibrations while C makes 3; that is, A making 420 vibrations per second, C makes 252; therefore, C_1 makes the half of this, or 126; C_2 makes 63, and C_3 31½. Again, C¹ makes twice as many vibrations per second as C, or 504; C² makes 1008, C³ 2016, and C_4 4032 vibrations per second. That is to say, in round numbers, the ear receives a musical impression from any sound which arises from a number of vibrations between 30 and 2000; and we may certainly say that, in every orchestra, the hearers are employed in distinguishing and discriminating between various rates of succession in the undulations of the air around them from 60 to 2000 per second.

We have previously alluded to a phenomenon of sound, or rather of combined sounds, called a *beat*. If two notes whose vibrations are either nearly in the same ratio, or nearly in one of the simple ratios above-mentioned, be sounded together, the effect of their being out of tune is a tremulous motion of the sound, the pulsations or beats of which can be counted if the notes be not too high. For example, suppose two simultaneous notes whose vibrations are 100 and 104 per second. Here 25 vibrations of the first are made during 26 of the second; and the reader who has studied the preceding part of this article will see that the resulting wave is as long as twenty-six of the second waves; but that if the waves from the two be much alike in their types, this resulting wave will consist of a cycle of rarefactions and condensations very much resembling the separate waves. The whole resulting wave being twenty-six times as long as the second wave, will run through all its changes *four* times in a second, which is not sufficient to give a musical sound, but will only add to the sound of one of the waves the periodical tremulous sensation which is called a beat, which may be imitated by ringing the syllables *who*, *ah*, in rapid succession on the same note of the voice. For information as to the use made of these beats, see the article TEMPERAMENT.

It only remains to consider the different character of sounds. The same note, as to *pitch* or tone, may be sounded by a horn and a flute; nevertheless, each instrument has a character of its own, which enables every one to distinguish between the two. It is not to the different loudness of the two, for either, by skilful players, may be made to give the weaker sound; neither does it depend on the number of vibrations, for that, as we have seen, determines only the pitch of the note: the only difference between one wave and another of the same length, is in the *form* of its type; that is, in the different manner in which the air is condensed and rarefied. There is also only this feature left, to account for the difference between the tones which different players will draw out of the same instrument; since both Paganini and an itinerant street musician would make the same string vibrate the same number of times in a second. The late Dr. Young, to whom the world is much indebted on this subject, as on almost every other, examined the string of a violin when in motion, and by throwing a beam of light upon it, and marking the motion of the bright spot which it made, he found that the string rarely vibrated in the same plane, but that the middle point would describe various and very complicated curves, corresponding to different manners of drawing the bow. [*Lectures on Natural Philosophy*, vol. ii. plate 5.]

We give three specimens, merely to show how much the vibration produced by one player may differ from that of another. The waves proceeding from all three will be of the same length, the vibrations being performed in the same time; but the condensations and rarefactions will evidently be such as to give very different relative states to contiguous particles of air. The middle of the stretched wire describes the curve on which it is placed, during what we have hitherto called two vibrations.

Fig. 14.



It might tend to throw light upon this part of the subject if practical musicians would observe, in the same manner, the curves which they produce, and describe the different qualities of tone arising from them. As yet, we have no direct experiments which tend to connect any particular form of vibration with any particular quality of sound. We shall enter upon the best method of doing this in the article CHORD.

Some confusion arise in books on this subject, from the use which different authors make of the words *vibration* and *wave*. Some mean, by a vibration, a motion to and fro, which, in this article, we have called *two* vibrations; and by a wave, the complete succession of condensations and rarefactions, which we have called *two* waves, one of condensation, the other of rarefaction. For further information, we refer the reader to Sir J. Herschel's article, already cited, to Robison's *Mechanical Philosophy*, Biot's *Précis Elémentaire de Physique*, and Pouillet's *Traité de Physique*.

ACQUAPENDENTE, a town in the Roman States, near the confines of Tuscany, on the high road from Florence to Rome. (Lat. 42° 46′ E., long. 11° 52′.) The name is derived from the fall of water from the rock on which it stands. It is built on a steep hill which rises above the river Paglia, and is surrounded by walls. Girolamo Fabrizio, a celebrated anatomist and professor at Padua in the sixteenth century, was a native of this town. It was but an insignificant place until 1650, when Pope Innocent X. having razed to the ground the neighbouring town of Castro, where a bishop had been murdered, transferred the see to

Acquapendente. The town looks ill-built and dull: it belongs to the delegation or province of Viterbo, and is seventy miles N.N.W. of Rome. It contains a cathedral, and about 2400 inhabitants.

ACQUITTAL (from the French *acquitter*, to free or discharge) signifies a deliverance and setting free of a person from a charge of guilt; thus a man who, upon his trial for a criminal offence, is discharged by the jury, is said to be acquitted. The acquittal by the jury has, however, no force in law until judgment has been given upon the verdict by the court in which the proceedings are instituted.

After judgment of acquittal, if the party be indicted a second time for the same offence, he may plead his former acquittal as a bar or a complete answer to the second charge, and upon such former acquittal being admitted or proved, the person indicted will be entitled to be discharged, as the law will not permit a man to be twice put in danger of punishment for the same offence.

ACQUITTANCE is a discharge in writing of a debt, or sum of money due. A general receipt or acquittance in full of all demands will discharge all debts, except such as are secured by what are termed *specialties*, viz., bonds and instruments under seal; which are considered by the law as of too great force to be discharged by a verbal concord and agreement, or any less formal and solemn acquittance than a deed. Where an acknowledgment of satisfaction is by deed, it may operate as a good answer to an action on the debt, even though nothing has ever been actually received.

Courts of equity, and even courts of law, will, in some cases, order accounts to be gone into anew, notwithstanding the production of a general acquittance or receipt in full of all demands, upon proof that such acquittance was obtained by fraud or given under a mistake, and that the debt or other demand has not been in fact satisfied.

ACRE, a measure of land, of different value in the different parts of the United Kingdom. When mentioned generally, the statute or English acre is to be understood. Its magnitude may be best referred to that of the square yard by recollecting that a square whose side is 22 yards long is the *tenth* part of an acre; whence the latter contains 22×22×10, or 4840 square yards. The chain with which land is measured is 22 yards long; so that *ten* square chains are one acre. This measure is divided into 4 roods, each rood into 40 perches, so that each perch contains 30¼ square yards. Thus:—

Acre.		Rood.		Perch.		Square yards.	Side of equivalent squares in yards.
1	=	4	=	160	=	4840	69.5701
		1	=	40	=	1210	34.7851
				1	=	30¼	5.5

The Irish acre is larger than the English, inasmuch as 100 Irish acres are very nearly equivalent to 162 English acres. More correctly, 121 Irish acres are 196 Englis hacres; but the former ratio points out an easier arithmetical operation, and will not be wrong by so much as one acre out of 5000.

The Scottish acre is also larger than the English, 48 Scottish acres being equal to 61 English acres. There are also local acres in various parts of England, such as the Cheshire acre of 8 yards to the pole. The English statute acre is used in the United States of North America.

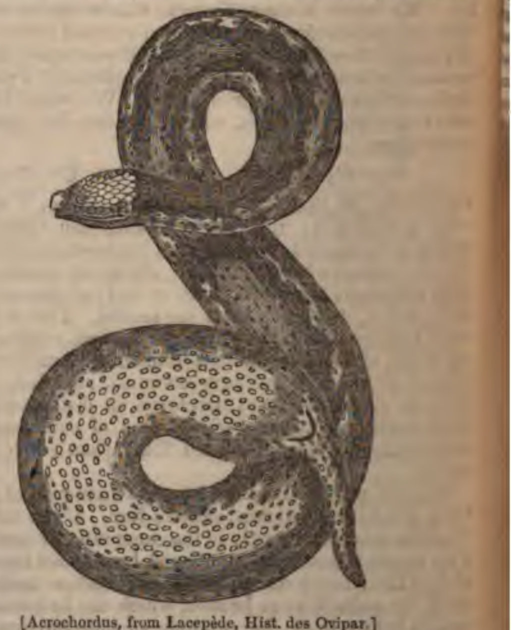
The French *Are* is a square whose side is 10 metres, and 1000 English acres are equivalent to 40,466 ares.

For further information on the comparison of English and other acres, we refer the reader to Kelly's *Cambist*, a very useful work.

ACRE (ST. JEAN D'), a town of Syria on the seacoast (N. lat. 32° 54′, E. long. 35° 4′), and on a small promontory, which, with Mount Carmel lying to the south, forms a circular bay: it is sometimes called Acra and Acca. Its oldest name was probably Acco, which was changed to that of Ptolemais during the sovereignty of the Greeks in Syria: the name of Acco was revived after it fell into the hands of the Saracens. Acre is well known in the history of the Crusades, having been taken in 1191 by Philip Augustus of France and Richard I. of England. It was for some time in the possession of the Knights of Malta, during whose occupation it was strongly fortified, and filled with churches. Acre was in a very ruinous condition in the middle of the seventeenth century, when Thevenot visited it, but it has since been improved, and is now said to contain 15,000 (some authorities say 20,000) inhabitants. This restoration was due to Sheik Daher, who, in the middle of the eighteenth century, strengthened the town and revived its commerce. Jezzar Pasha, his successor, fortified the place very strongly, and built a new mosque, according to Turkish fashion adorning it with columns that once belonged to the old Greek edifices of neighbouring cities. The streets of Acre are narrow, and the houses, which are of stone, have flat roofs. The port is small and not deep, yet it is one of the best along this coast. Europeans carry to Acre cloth, lead, tin, &c., and receive in exchange some cotton and rice. The great celebrity of Acre, in more recent times, is owing to Bonaparte's attempt to storm the place in the spring of 1799, when he entered Syria at the head of 12,500 men. The obstinate defence of the garrison commanded by Jezzar, and aided by Sir Sidney Smith with English sailors, saved Acre from the repeated assaults of the French general, who, after spending more than sixty days before it, and losing near 3000 men, retreated to Egypt. Since the siege in 1799 the fortifications have been repaired, but, in the last year (1832), Acre has had to withstand another siege, and is at present in the hands of the Pasha of Egypt, who took it from the Sultan of Constantinople, his master, on the 2d of July.

Acre is also the name of one of the Syrian pashalicks, which in late years has been bounded to the north by that of Tripoli, to the south and east by the pashalick of Damascus, and on the west by the Mediterranean. Its chief ports are Acre and Beirout. We propose to describe the whole country under the more permanent and general name of SYRIA.

ACROCHO'RDUS (a word formed from the Greek, which signifies *a wart*), in Zoology, a genus of serpents discovered in Java by the traveller Homstedt, and described in the *Memoirs of the Stockholm Academy of Sciences* for 1787. This genus is easily distinguished from others of the innoxious family of serpents by the innumerable small scales which cover every part of the head and body both above and below, and which in preserved specimens, or when the live animal distends the lungs and body with air, assume the appearance of so many granulated warts or tubercles. This circumstance has suggested the name of acrochordus, which conveys a pretty accurate idea of the external covering of the animal described by Homstedt.



[Acrochordus, from Lacepède, Hist. des Ovipar.]

The acrochord, in fact, is covered with scales like all other serpents, though they are minute and separate from one another: each of them is marked with three small ridges, and it is only when the skin is inflated, and apparent between the scales, that these assume the granulated or warty appearance expressed by the name. The head of the acrochord is flat, the mouth provided with a double row of small, sharp teeth, but without poison fangs, and the throat capable of enormous dilatation. Though deprived of the ordinary apparatus by which venomous serpents convey their poison, zoologists are not yet agreed in considering the achrocord as altogether innocent. MM. Appel and De Blainville affirm that they have found a peculiar bone in the head of this serpent, which they conceive to supply the place of the poison fang: Cuvier, on the other hand, denies the existence of this bone altogether, and brings forward the testimony of M. Leschenhault in favour of the harmless nature of the acrochord; and as the latter gentleman travelled for some time in Java, and made various experiments upon the live animals, for the purpose of ascertaining this point, there seems to be no reason to doubt the truth of his report. The tongue of the acrochord is short and thick, the vent simple and without the horny spurs which are common to many other genera of serpents. The only species sufficiently known at present is

The *Oular Carron* of the Javanese, the *Acrochordus Javanicus* of Lacepède and others. The scales of this serpent are marked by three small carinated elevations; the body is black above, greyish-white beneath, and the sides are marked with black spots on a ground of the same colour as the belly. The head is covered with small scales, the mouth is contracted, and the under jaw shorter and broader than the upper. This animal averages from six to eight or ten feet in length, and its shape is altogether peculiar; the body does not gradually become thinner from the middle towards either extremity, as in the generality of serpents, but grows gradually thicker from the head to the vent, and there suddenly contracts, so as to form a very short, slender tail. In the thickest part of the body, immediately above its junction with the tail, the individual procured by Homstedt, of which the entire length was eight feet three inches, measured three inches in diameter, whilst the greatest breadth of the tail did not exceed half an inch, and its length was scarcely a ninth part of that of the whole body. This individual was a female, and, when opened, was found to contain five young ones perfectly formed, and about nine inches in length. It was caught in a plantation of pepper-trees, and the Chinese, who accompanied Homstedt, cooked and ate its flesh, and reported it to be of a most delicious flavour. The stomach contained a quantity of half-digested fruit, from which it has been inferred that this serpent is frugivorous, and, contrary to the habit of all other known species, feeds upon vegetable substances. Cuvier is incredulous upon this point: it is certainly a singular circumstance, and should be received with caution; but, on the other hand, we have no reason to doubt the testimony of Homstedt; and the mere singularity of the fact does not necessarily destroy its probability. We know, moreover, that tortoises, turtles, some genera of fishes, and even certain species of lizards,—all of them cold-blooded animals, and some approaching very nearly, in nature and organization, to the family of serpents to which the acrochord belongs,—live entirely upon vegetable food; and the knowledge of this fact ought to prepare us beforehand to expect the discovery of similar habits among certain tribes of serpents, rather than to reject them as impossible and as absurd fictions.

ACRO'NYCHAL (sometimes incorrectly written Acronical, and Achronical), a word derived from the Greek, signifying 'that which determines the extremities, or the beginning and end, of the night.' It is only used in reference to the rising or setting of the stars; and a star is acronychal or rises acronychally when it rises at or very near sunset, and consequently sets at or near sunrise. To determine what stars rise acronychally on any given night, elevate the pole of a common globe so that the arc intercepted between it and the horizon may be equal to the latitude of the place. Turn the globe until the sun's place is on the horizon at the *western* side, then will all stars which are either on or within a short distance of the horizon on the *eastern* side be acronychal.

ACRO'POLIS, a Greek compound word signifying 'the highest point of a city.' It was used to denote some hill, rock, or natural elevation, such as we find forming part of the sites of many ancient cities in Greece. It seems natural to conclude that such strong holds were among the places first occupied, and that they served as the kernel of a larger city. In course of time, when building spread, such eminences became strong posts analogous to castles or citadels in modern cities; and in many instances the possession of such posts was considered as equivalent to the possession of the cities themselves. Religious edifices also generally formed part of the structures of an Acropolis.

In modern times they have often served as places of refuge to the inhabitants from the attacks of an enemy, or from the incursions of corsairs. The term Acropolis is now most commonly applied to the rocky eminence of Athens, on which the remains of the Parthenon or Temple of Minerva stand; but this is only a limited use of the word. Corinth had an Acropolis called Acro-Corinthus, which is a much loftier and more commanding eminence than that of Athens. The view from the summit is extensive, and the temple on the Acropolis of Athens, nearly fifty miles distant, is distinctly seen. An eminence close upon the modern Argos in the Peloponnesus was the Acropolis of the ancient Argos, and then it was called Larissa. A ruined castle of comparatively modern construction occupies the summit of this rocky eminence, and shows in some parts traces of much earlier building. The Acropolis of Messene in the Morea, situated on Mount Ithome, is another remarkable specimen of these natural bulwarks which were once fortified according to the principles of Greek military science. [See Leake's *Morea*, 3 vols. 8vo.—Society's Plan of Athens.]

ACROSTIC, a Greek term, signifying literally the beginning of a line or verse. An acrostic is a number of verses so contrived that the first letters of each being read in the order in which they stand shall form some name or other word. According to some authorities, a writer named Porphyrius Optatianus, who flourished in the fourth century, has the credit of being the inventor of the acrostic. It is probably, however, of older date. Eusebius, the bishop of Cæsarea, who died in A.D. 340, gives in his Life of Constantine, a copy of Greek verses which he asserts to be the composition of the Erythræan Sibyl, the initial letters of which make up the words ΙΗΣΟΥΣ ΧΡΙΣΤΟΣ ΘΕΟΥ ΥΙΟΣ ΣΩΤΗΡ, that is, Jesus Christ, the Son of God, the Saviour. These verses, which are a description of the coming of the day of judgment, have also been translated into Latin hexameters so as to preserve the acrostic in that language, in the words Jesus Christus Dei Filius Servator. The translation, however, wants one of the wonderful qualities of the original; for it will be observed that the initial letters of the five Greek words being joined together, form the word ΙΧΘΥΣ, that is, *the fish*, which St. Augustine, who quotes the verses in his work entitled *De Civitate Dei*, informs us is to be understood as a mystical epithet of our Saviour, who lived in this abyss of mortality without contracting sin, in like manner as a fish exists in the midst of the sea without acquiring any flavour of salt from the salt water. This may be therefore called an acrostic within an acrostic. But there are also other ways of complicating these ingenious productions. Addison, who notices this along with other sorts of false wit, in his lively papers on that subject in the first volume of the *Spectator*, says, 'there are *compound* acrostics, where the principal letters stand two or three deep. I have seen some of them, where the verses have not only been edged by a name at each extremity, but have had the same name running down like a seam through the middle of the poem.' There are even instances of the same name being five times repeated in so many successive columns. Such an acrostic has been designated a *pentacrostic*. This species of elaborate trifling was extremely fashionable among the early French poets, from the age of Francis I. down to that of Louis XIV. Some also of our English poets of considerable eminence used formerly to amuse themselves in the same way. Thus, for instance, among the works of Sir John Davies, are twenty-six short poems entitled *Hymns to Astræa*, each of which is an acrostic on the words *Elizabetha Regina*. These, which were first published about the end of the sixteenth century, are perhaps the most elegant compositions of this description in any language. Afterwards such puerile ingenuity fell into disrepute; and Dryden, in his *Macflecknoe* (published 1682), contemptuously makes the dying monarch of the realms of nonsense and dulness address his son and successor Shadwell:—

> 'Leave writing plays, and choose for thy command
> Some peaceful province in acrostic land.'

The acrostic, being addressed merely to the eye, and conveying no pleasure either to the imagination or to the ear, cannot of course add to the poetical effect of the lines which it ornaments—any more than would the printing of the initial letters in a differently coloured ink. But it is sometimes useful, as an aid to the memory, in recollecting such verses as are composed only to be got by heart, for the sake of the facts of which they form a summary. Thus, in some editions of the Latin dramatist Plautus, we find prefixed to each play a few verses which contain at the same time an acrostic on its name and a sketch of the plot. In this case, the knowledge of the initial letter of each line must help the memory to recover it, if it should be forgotten. There are two epigrams in the Greek Anthology, one in honour of Bacchus and the other of Apollo, which are called acrostics, though of a somewhat peculiar fashion. Each contains twenty five verses, of which the first introduces the subject of the poem, and each of the twenty-four others consists of four words, which are epithets of the god: all the epithets in the first line begin with A. those in the second with B, and so on. These poems, therefore, are merely acrostics on the alphabet, four deep. The Jews sometimes employ a sort of acrostic in designating many of their writers. Thus the commentator on *Maimonides*, Rabbi Yom Tof bar Abraham, is commonly called Ritba. from the initial letters of the five words composing his full title. (See this explained in the article entitled 'Literary Chronology,' in the *Companion to the Almanac* for 1832.) The initial syllables of the verses of the Psalms were anciently called acrostics. The following is a curious specimen of a Latin acrostic:—

S A T O R
A R E P O
T E N E T
O P E R A
R O T A S

ACROTE'RION (in Architecture), a Greek term, signifying 'the extremity of anything.' It is used technically to designate the statue or other ornament on the summit or upper angle, and is sometimes applied also to the similar ornaments over the feet, or lower angles, of a pediment; in the latter case they are all included under the plural *acroteria*. Some writers understand by this term only the bases or pedestals on which the acroterial ornaments are placed; for this restriction, however, there is no good reason, but rather the contrary, as it would leave the ornaments themselves without an appropriate designation. It may, indeed, with great propriety be used much more extensively than has been the custom. The *finial* on the apex of a spire, pinnacle, or gable, in works of pointed architecture, is an acroterion; and in St. Paul's Cathedral in London, although the pediments over the entrance fronts have their acroteria, which are statues of some of the Apostles, yet the acroterion of the edifice is the cross which surmounts the grand central part of the composition. This term is not found in many ancient authors; we derive it from Vitruvius, who uses it in the plural sense abovementioned. Plutarch, in his life of Cæsar, makes use of it in the singular number, and in the purely architectural sense as we have rendered it.

ACT OF PARLIAMENT.—See Statute.

ACT (in the Universities). An exercise to be performed by students before they are admitted to their degrees. In the University of Oxford it has almost fallen into disuse, and in Dublin is a mere form; but at Cambridge it is still preserved as a preliminary test of the comparative merits of the candidates for the degree of Bachelor of Arts, who aspire to University honours. It is also performed by candidates for the degrees in law, physic, or divinity. The student proposes certain questions connected with his subject to the presiding officer of the *schools* (the place in which acts are kept), who thereupon nominates other students to oppose them. The discussion is carried on syllogistically and in Latin, and terminates by the presiding officer questioning the *respondent* or the person who is said to 'keep the act,' and his *opponents*, and dismissing them with a short compliment to each, in proportion to his deserts.

The severest exercise of this kind being that undergone by candidates for the degree of Bachelor of Arts, with *honours*, at Cambridge, we will describe it more particularly. The *moderator*, or examiner for the year, gives notice to a student that he is to keep an act; who thereupon writes three questions which he proposes to maintain and defend. The first is always from Newton's *Principia;* the second from any other mathematical subject; and the third from some metaphysical or moral writer. The following is an example of the form in which they are given:—

Rectè statuit Newtonus in Sectione primâ libri primi.

Rectè statuit Lagrangius in capite primo libri de theoria functionum.

Rectè statuit Lockius de principiis innatis.

The above signifies that the student intends to maintain the correctness of the first section of Newton's *Principia*, the first chapter of Lagrange's *Theory of Functions*, and the chapter of Locke on the *Human Understanding* which treats of innate principles.

The moderator, on receiving these, nominates three students, whose attainments, he thinks, will enable them to propose arguments on the other side. On the day appointed, the moderator having taken his chair, the *respondent* reads a Latin thesis, usually on the third subject; after which the opponents, in succession, propose their arguments against the several subjects, which, of course, are usually ingenious fallacies. If the respondent can answer them, he does so; if not, the moderator endeavours, by questioning him, to find from what defect in his knowledge of the subject this arises. As each opponent is dismissed he is also questioned by the moderator, as above stated.

The syllogistic form is not strictly retained at present in keeping an act; and the Latin spoken is very indifferent. The chief purpose of an act now-a-days is to get a sort of notion of the qualifications of the candidates, as the examination is proportioned in severity to their supposed capacities. In older times an act was a very important feature in obtaining a degree. The utility of the present form is doubted by many persons.

ACT (in the Drama.) That portion of a play, which is separated from the rest by an interval, during which the stage is left empty, and the action is supposed to proceed unseen by the spectators. In the Greek drama there were no acts; although in some modern editions, such as Burton's *Pentalogia*, we find Greek plays thus divided. The language does not possess a word answering to the Latin and English *Act*. Among the Greeks the stage was never left empty from the beginning to the end of the performance; when the other actors retired, those forming the chorus still remained, and continued the business of the play by their songs. For these songs, it is important to observe, were in general essential parts of the drama; they were not of the nature of a piece of music, or a dance, or any other extrinsic representation, thrown in merely to fill up a chasm in the action; they carried forward the action in the same manner as the ordinary dialogue did. For an exact copy of the form of a Greek drama in this respect, the English reader may be referred to the *Sampson Agonistes* of Milton. In that play there is no division into acts; nor is there any such division in Buchanan's two Latin tragedies, entitled *Jephthes* and *Baptistes*, which are also professedly composed upon the Greek model. The latter poet, we may add, has followed the same plan in his translations of the Medea and the Alcestis of Euripides. From this constitution of the Greek drama, it naturally followed, that the real duration of the action of any play could not well be supposed greatly to exceed that of its theatrical representation. In other words, what has been called the Unity of Time became a principle almost invariably observed in every dramatic composition. On the Roman stage there was no chorus, and the play was divided into acts, as on our own. But, although Plautus has frequently in his comedies supposed a considerable portion of time to pass between the close of one act and the opening of another, the most famous of the Latin dramatists, Terence, has not availed himself of this liberty, but has adhered closely to the practice of his Grecian models, in not permitting the interval between the acts to form more than a very short interruption of the progress of the story. By modern dramatists, however, the practice of dividing a play into acts has generally been taken advantage of to extend the time of the story greatly beyond the space to which it was necessary to confine it on the Greek stage. Each act, in fact, is now what the Greeks would have called a separate drama, except that it does not contain a complete plot; and the whole play may be compared to those Trilogies of the Greeks, in which three dramas, representing so many successive separate parts of the same history, followed one another in one theatrical exhibition. Perhaps it was this consideration which made the Romans call each of the separate portions in question an *Act* or *Actus;* for that word is exactly a translation of the Greek *δρᾶμα*, which was used to designate an entire play. The term, therefore, may be taken as in its original and proper sense, denoting a distinct, and, to a certain extent, independent theatrical action or picture, although capable also of being introduced as one of a series of such pictures, united by some common subject. And this is precisely what Shakspeare must be understood to mean, when, in the famous speech which he puts into the mouth of Jaques in *As you like it*, comparing the world to a stage, he goes on to say, 'One man in his time plays many parts, his *acts* being seven ages.' The infant, the school-boy, &c., are *acts*, only in the sense of being so many separate pictures or exhibitions of human life, each complete in itself, although following each other according to a natural order of succession, like the acts of a play. Viewed in this light, it will be perceived, that the division into acts, is really that distinction of the modern drama which more than anything else gives to it its peculiar character. Dr. Johnson has observed, in modern plays, 'The time required by the fable elapses, for the most part, between the acts; for of so much of the action as is represented, the real and poetical duration is the same. . . . . . The drama exhibits successive imitations of successive actions; and why may not the second imitation represent an action that happened years after the first, if it be so connected with it, that nothing but time can be supposed to intervene. Time is, of all modes of existence, most obsequious to the imagination; a lapse of years is as easily conceived as a lapse of hours.'—*Pref. to Shakspeare.*

We may here remark, that although the French dramatic writers have adhered to the principle of leaving the stage empty only at the end of an act, many of the English have followed a different practice. In Shakspeare particularly, every successive scene uniformly presents a new set of characters, and most commonly a change of place also. He rarely interrupts the action, however, for any considerable space, except during the interval between two acts; but here he does not hesitate to pass over any length of time he may find convenient. In the *Winter's Tale*, Perdita, who who was a new-born infant at the end of the third act, is grown-up a young woman at the beginning of the fourth. In this instance, indeed, the dramatist introduces Time to explain and apologize for the licence he had taken to

> ———— 'Slide
> O'er sixteen years, and leave the growth untried
> Of that wide gap.'

Time is here said to appear 'as Chorus;' and in the beginning of Henry V., Chorus is also brought forward to request the audience to allow their thoughts in the course of the representation to pass from one place to another—

> ———— 'Jumping o'er times;
> Turning the accomplishment of many years
> Into an hour-glass.'

Neither of these personages, however, performs exactly the office of the ancient chorus.

We may add, that the old English Mysteries and Moralities, the first produce of our national dramatic genius, were long destitute of any division either into scenes or acts. This is the case, for instance, with Parfre's Mystery entitled *Candlemas Day, or the Killing of the Children of Israel*, written in 1512, and first printed in Hawkins's *Origin of the English Drama.* In this performance there are not even any stage-directions. The Morality of *Every Man*, printed early in the reign of Henry VIII., and that of *Hycke Scorner* of the same age, are, in like manner, without either stage-directions or any division into acts or scenes. In the Morality of *Lusty Juventus*, again, which was published in the reign of Edward VI., there are stage-directions, but still no mention of acts or scenes. The earliest of the Moralities which assume the regular dramatic shape are not more ancient than the beginning of the reign of Elizabeth. Moralities continued to be both printed and acted long after this date. We may mention, among others which appeared after Elizabeth came to the throne, Skelton's *Life and Repentance of Mary Magdalene*, 1567; *The Marriage of Wit and Science*, 1570; *The Conflict of Conscience*, 1581; *The Three Lords of London*, 1590; &c. Even Mysteries were performed in the reign of Mary. Nay the Chester Mysteries were performed in the year 1574. Down to this time there is every reason to believe that the scene never was changed from the beginning to the end of any stage-spectacle. As for the Moralities, they were acted even in the reign of James I., and they are enumerated under the name of 'Morals' in the licence granted to the company of which Shakspeare was a member in 1603. But even several of our early tragedies and comedies, down to an era subsequent to this, were without any division into either scenes or acts. There is no such division in Preston's *Cambises*, the play to which Shakspeare is supposed to allude in *Henry V.*, and which the author entitles *A lamentable Tragedy mixed full of pleasant Mirth*, printed in 1561; nor in Peele's *David and Bethsabe*, which appeared in 1579. In the tragedy of *Soliman and Perseda*, 1599 (supposed to be by Kyd), there are acts, but not scenes; but there are neither one nor other in Dekker's *Satiromastix, or the Trussing of the Humorous Poet*, nor in the comedy of the *Wily Beguiled*, both of which appeared after the commencement of the seventeenth century, the latter so late as 1623.

Much discussion has taken place among the critics on the reasons of the rule which restricts a regular dramatic composition to the extent of neither more nor less than five acts; and which Horace, in his Art of Poetry, has laid down in a peremptory and well-known verse. Upon this subject the French writer, Marmontel, has delivered a very sensible judgment:—'The established usage of distributing a tragedy into five acts, neither stands upon such a foundation as to constitute it an essential law, nor is it so unreasonable as to deserve to be banished from the theatre. When the subject is such as to furnish that number, five acts allow a desirable extension to the action; in that space great events find room; great interests and great characters have freedom to develop themselves; the situations lead in each other; one incident announces the next; the sentiments are introduced without bluntness or harsh collision; the movement of the passions has time to attain the requisite acceleration, and the interest to grow to the highest degree of pathos and intensity. It has been found by experience that the attention, the illusion, and the emotion, which a spectacle of this duration excites, are not too great for the audience. * * * But the subject may be naturally such, as, not affording room for more than two or three points of repose, not to be susceptible of more than the same number of situations striking enough to form successive steps in the action. Must the subject in that case be abandoned, although pathetic, interesting, and teeming with beauties? or must it be overlaid with scenes and incidents that do not properly belong to it? By no means. The action must have its just extent given to it, and no more. The law of nature must be followed, which is superior to that of art.'—[*Encyclopédie*, Art. *Acte.*]

ACT of FAITH.—[See Auto da Fe′.]

ACTA DIURNA (proceedings of the day) was the title of a gazette, to use the nearest modern term, drawn up and published daily at Rome both under the republic and the empire. It appears to have contained an abstract of the proceedings of the public assemblies, of the law courts, of the punishment of offenders, an account of any public buildings or other works in progress, together with a list of births, deaths, marriages, and divorces, &c. In the very earliest times of Rome provision was made under a religious sanction for the due registration of birth, assumption of the *toga virilis* (or dress of manhood), and death, accompanied by the payment of a certain fee into the respective treasuries of the goddesses *Juno Lucina*, *Juventas*, and *Venus Libitina.* From the registers thus formed such extracts as were important might be made for publication. The law courts would furnish authority for the statement of divorces; and in this article of news there was no deficiency. Not a gazette appears, says Seneca, without its divorce, so that our matrons, from constantly hearing of them, soon learn to follow the example. The due supply of information on political and judicial affairs was to be obtained, as now, by reporters (*actuarii*). In the celebrated debate of the Roman Senate, upon the punishment of those who had been concerned in the Catilinarian Conspiracy, we find the first mention of short-hand writers, who were specially employed by Cicero to take down the speech of his friend Cato; and it is interesting to observe that this was the only speech of that extraordinary man which still existed in the age of Plutarch. But it must not be inferred from this fact, that these reporters or any other persons were at liberty to publish an account of any proceedings in the senate. Until the first consulship of Julius Cæsar the senate was a close court. This great man, by a ludicrously distorted view of Roman history, has been generally represented as the destroyer of his country's liberties, and he was doubtless prompted by motives of personal ambition; yet he no sooner entered upon his office than he made provision for giving the same publicity to all the proceedings of the senate which already existed for the more popular assemblies; and this single act was, perhaps, the most fatal blow which Cæsar gave to the aristocratic interest. [Suetonius, *Life of J. Cæsar*, c. 20.] Under the despotism of Augustus such an institution was inconvenient, and, therefore, repealed. The *Acta* of the senate, though, of course, still registered, were no longer published; and, as all the popular assemblies were now deprived of real authority, the *Acta Diurna* henceforward can have had little political interest. Even in its best days this state gazette was, no doubt, an extremely meagre document,—conducted as it was on government authority, without the advantages of competition, and what is still more important, without the possibility of extensive circulation; for what could a newspaper have been before the art of printing was discovered? Yet, with all these disadvantages, the *Acta Diurna* were often consulted and appealed to by the historians of after times, as documents of the highest authority. [For a more minute account, see Lipsius in his *Excursus* on the Annals of Tacitus. Lib. v. c. 4.]

ACTA ERUDITO'RUM, the title of one of the oldest and most celebrated literary and scientific journals. It began to be published at Leipzig in January 1682, under the conduct of the learned Otto Mencke, one of the professors of the university, assisted by several of his brother professors, and especially by Carpzov (Morhof, *Polyhistor*, i. 178. edit. 1747). The numbers, which were in 4to., appeared once a month. On the death of its original editor in the beginning of the year 1707, the management of the journal was undertaken by his son John Burchard Mencke; on whose death, in 1732, the charge devolved on his son Frederic Otto. The property of the work seems to have remained to the last in the hands of the Mencke family, or their heirs; but the latter editors were not men of distinguished name. The last was Charles Andrew Bel, professor of philosophy in the university, who, after managing the publication from 1754, died on the 4th of April, 1782. The volume for 1776, was only published in that same month. It was the last which appeared; although the publisher intimates his hope that the work will regain its ancient reputation, having thus got rid of the editor who had allowed it to fall so sadly into arrear, a matter, he remarks, concerning which the less that is said the better. The Acta Eruditorum was the first critical journal published in Latin; and it did not confine itself merely to reviews of books, but inserted also accounts of scientific discoveries, and of the general progress of mathematical and physical science. It was here that Leibnitz, who was a frequent contributor in the early period of the work, first announced his method of the differential calculus. In the hands of its early editors, it was considered to be admirably conducted; and Morhof congratulates his countrymen on having, in this publication, produced something which even commanded the approbation of foreigners, 'who rarely,' he is pleased to add, 'find anything done by us (the Germans) to their taste.' He mentions a translation of the Acta into French, which had been undertaken; but this undertaking does not appear to have proceeded beyond the first volume, which was published in 12mo. at the Hague in 1685, under the title of *Ouvrages des Savans, publiéz à Leipzig*. After the first fifty volumes, coming down to the end of the year 1731, the journal took the name of the *Nova Acta*, or the New Acts. The first series, besides the fifty regular volumes, consists of ten supplementary volumes, one having been published every five years. Occasional supplements also appeared in the course of the new series; which, together with several volumes of Indices, make the complete work amount to 117 volumes.

Many other journals established in imitation of that of Leipzig also assumed the name of Acta; as, for instance, the *Deutsche* (or German) *Acta Eruditorum*, begun to be published in 8vo., at Leipzig, in 1712, and which was continued till 1740, the whole forming 20 volumes; the *Fränkische Acta Erudita et Curiosa*, a journal of French literature, published at Nuremberg, from 1726 till 1732; the *Deutsche Acta Literaria*, which began at Leipzig in 1715, but did not last above a year or two; &c. Under this head also we may notice the English journal, entitled the *History of the Works of the Learned*, of which the first monthly number appeared at London, in small 4to., in January 1699, and of which 13 volumes were published under that title, when it was discontinued at the end of the year 1711. The same title, however, was again adopted in 1737, by a periodical work which first appeared in 1735, under the name of the *Literary Magazine*, or *Select British Librarian*. It continued to flourish under its new designation till the year 1743, when it closed with the publication of its 14th volume. This publication is not to be confounded with another critical journal which appeared at London in 4to., in 1691, under the title of *The Works of the Learned*, by J. la Crose, a late editor of the *Universal Bibliotheque*. It continued only for a few years. The *Universal Bibliotheque* was an English translation, which was published for a short time, of Le Clerc's *Bibliothèque Universelle*, begun at Amsterdam in 1686. There was also a work called an *Historical Account of Books and Transactions of the Learned World*, which began to be published at Edinburgh in 12mo., in 1688. [See Watt's *Bibliotheca Brit.*] The title Acta has also sometimes been given to the published Memoirs or Transactions of Learned Societies.—[See ACADEMY, and SOCIETY.]

ACTÆ'A. Under the name of ἀκτῆ, the Greeks described a medicinal plant, which the moderns have ascertained to be what is now called *Sambucus ebulus*. [See SAMBUCUS.] Linnæus applied the name to a genus of perennial herbaceous plants found in various parts of Europe and the north of Asia, and America, belonging to the natural order Ranunculaceæ, and only in a slight degree resembling the species intended by classical authors. The genus thus understood is known from all others of the Ranunculus tribe by its anthers being turned inwards, so that when they burst, the pollen may immediately fall upon the stigma, while its flowers have only four sepals and four petals. All the species have their leaves in many broad divisions, and their blossoms arranged in tall, branched panicles; these are followed by little fleshy, berry-like fruits, of a black, or white, or red colour. The properties of all the species are nauseous and deleterious, as might be expected from their affinity to the poisonous Aconite.

One species, *Actæa spicata*, a common European plant, is found occasionally in the north of Yorkshire among bushes; it is popularly called Black baneberries and also Herb Christopher. It has purplish-black juicy fruits, which would be dangerous from their tempting appearance, if the fetid odour of the leaves did not prevent their being touched.

Another species, the *A. cimicifuga*, a North American plant, derives its name from the belief that its fetid leaves have the power of driving away bugs.

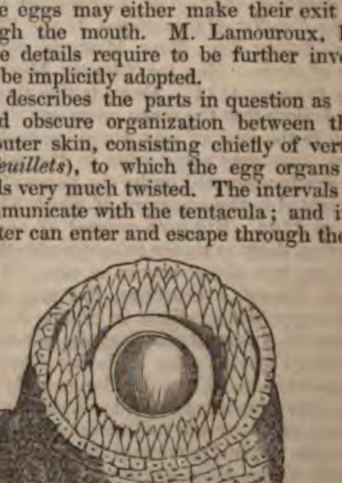
ACTI'NIA, a genus of animals belonging to the sea nettles (*Acalephæ*, Cuvier), and distinguished by the form of their body, which is simple, cylindrical, soft, fleshy, and susceptible of contraction and dilatation. The same aperture, which serves for the mouth and the vent, is terminal, and margined with one or more rows of tentacula. These can be folded down into the aperture, and concealed under the outer envelope. When they are extended, they give the animal the appearance of a flower, increased by the lively colours with which they are adorned—a circumstance that has given rise to the popular names of *animal flowers* and *sea anemonies*, usually applied to the various species of *actinia*.

The internal structure of the genus has been carefully investigated by Dr. Spix, a Bavarian naturalist, well known by his travels in Brazil. Dr. Spix found in these animals an alimentary cavity, ending in a single aperture, very large at the lower end, and so elastic and contractile, that it could easily be turned inside out. The cavity is surrounded with flat muscles, running lengthwise and parallel. The nerve knots, or ganglia, are situated in the lowest and broadest part of the body. These have intercommunications, and are distributed to the principal organs by filaments more or less obvious.

The egg organ (*ovarium*) in a female was found to be filled with small eggs, and was composed of three or four tubes, cylindrical, cohering, and forming by their union a sort of egg tube (*oviductus*), which opened into the stomach. These tubes communicate with the tentacula in such a manner that the eggs may either make their exit through them, or through the mouth. M. Lamouroux, however, thinks that these details require to be further investigated before they can be implicitly adopted.

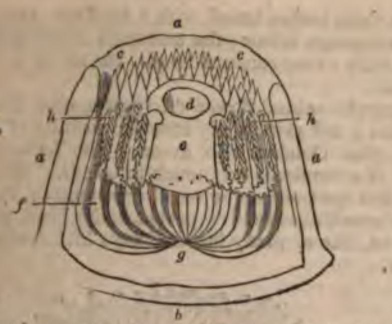
Baron Cuvier describes the parts in question as a rather complicated and obscure organization between the inner cavity and the outer skin, consisting chiefly of vertical and fibrous plates (*feuillets*), to which the egg organs adhere, similar to threads very much twisted. The intervals between these plates communicate with the tentacula; and it further appears that water can enter and escape through the minute

Fig. 1.



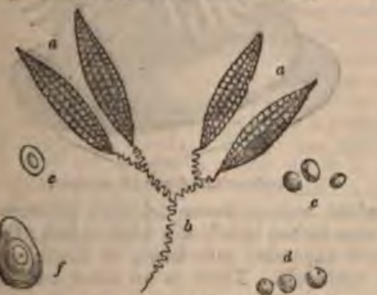
Small leathery animal flower (Actinia coriacea).

Fig. 2.



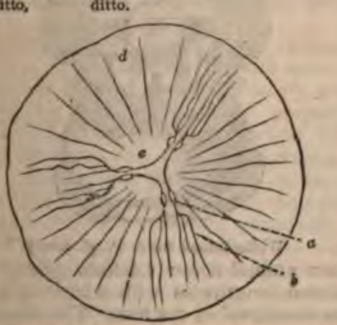
Vertical section of the above, to show its interior structure.
a. The skin.
b. The base, by which the animal is fixed to the rocks.
c. The three rows of feelers (tentacula).
d. The mouth.
e. The stomach.
f. Longitudinal muscles.
g. Point in which they unite.
h. The ovaries, which open by their oviducts into the stomach.

Fig. 3.



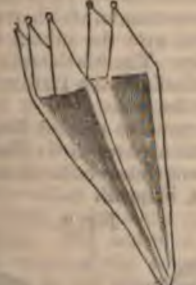
a a. The ovaries greatly magnified.
b. The oviduct.
c. Eggs.
d. Ditto, with the first appearance of the embryo
e. Ditto, further advanced.
f. Ditto, ditto.

Fig. 4.



Distribution of the nerves, at the base of the actinia.
a. The nervous ganglions.
b. Nerves.
c. Nerves of communication between the gangiions.
d. The longitudinal muscles.

Fig. 5.



Longitudinal muscles, with the feelers (magnified).
[These cuts are from the Annales du Museum, vol. xiii. plate 33.]

nings of these around the mouth; at least, the animal thence squirt out water.

The Abbé Dicquemare studied the *actinia* in a manner rthy of the highest praise, having observed them in all ir stages, and multiplied his experiments to a great ent. It is not, therefore, to be wondered at that most hors have contented themselves with copying his details. tells us that the forms of *actinia* vary according to their traction or expansion, presenting innumerable varieties. eir expansion is a more certain indicator of fine weather than the rise of the barometer; but this cannot be practically taken advantage of except during summer, as the cold of winter drives the *actinia* from the shore to the deeper waters, where the temperature is more equable and mild. On changing their place of abode, some abandon themselves to the mercy of the waves, others creep along the bottom, turning themselves inside out, and making use of their tentacula as feet. When they find a suitable place, they fix themselves often so firmly, that they cannot be detached without tearing their bodies. Dicquemare, and many others, suppose that this adherence, continuing even after the death of the animal can only be accounted for from a viscous fluid secreted at pleasure; while others, with MM. Bosc and Lamouroux, believe that it is caused by suction, producing a vacuum.

Our distinguished English naturalist, Ellis, has given a very minute and, so far as it goes, an accurate account of these animals in the *Philosophical Transactions*, part of which it may be interesting to quote:—

'The lower part,' he says, 'of these bodies have a communication with a firm, fleshy, wrinkled tube, which sticks fast to the rocks, and sends forth other fleshy tubes, which creep along them in various directions. These are full of different sizes of these remarkable animals, which rise up irregularly in groups near to one another.

'This adhering tube, that secures them fast to the rock or shelly bottom, is worthy of our notice. The knobs that we observe are formed in several parts of it by its insinuating itself into the inequalities of the coral rock, or by grasping pieces of shells, part of which still remain in it, with the fleshy substance grown over them. This shows us the instinct of nature, that directs these animals to preserve themselves from the violence of the waves, not unlike the anchoring of mussels, by their fine silken filaments that end in suckers; or rather, like the shelly basis of the serpula, or worm-shell, the tree oyster, and the slipper barnacle, &c., whose bases conform to the shape of whatever substance they fix themselves to, grasping it fast with their testaceous claws, to withstand the fury of a storm.

'When we view the inside of this animal dissected lengthwise, we find like a little tube leading from the mouth to the stomach, from whence there rise eight wrinkled small guts, in a circular order, with a yellowish soft substance in them; these bend over, in the form of arches, towards the lower parts of the bulb, from whence they may be traced downwards, to the narrow part of the upright tube, till they come to the fleshy adhering tube, where some of them may be perceived entering into a papilla, or the beginning of an animal of the like kind, most probably to convey nourishment till it is provided with claws: the remaining part of these slender guts are continued on their fleshy tube, without doubt, for the same purpose of producing and supporting more young ones from the same common parent.

'The many longitudinal fibres that we discover lying parallel to each other, on the inside of the semi-transparent skin, are all inserted in the several claws round the animal's mouth, and are plainly the tendons or muscles for moving and directing the claws at the will of the animal: these may be likewise traced down to the adhering tube.'—[*Phil. Trans.*, vol. lvii.]

A strong light incommodes the *actinia*, noise startles them, they are affected by odours, and fresh water causes them to die. These various feelings originate in their great irritability, which appears to increase according to their sufferings. They can support a temperature as low as 45°, and up to 140°, Fahr.; but beyond these extremes they perish. They are often left exposed to the air during spring-tides; but in such cases they always retain a great quantity of water, which they squirt out with force when molested.

These singular creatures have a power of reproduction equal to that so well known in the fresh-water polypus. (*Polypus viridis*, Bony.) They may be cut perpendicularly or across, and each cutting will give origin to a new animal. The young *actinia* are seen issuing, already formed, sometimes from the mouth; and sometimes the base of the old animal is dissevered, a portion remaining attached to the rock, where it continues to live, increasing in size, becoming more and more rounded, while, in a short time, a mouth, stomach, and tentacula are formed, presenting, to the surprise of the observer, a complete *actinia*. At length, the side portions of this base give out globules, which are detached, fix themselves upon adjacent rocks, where they grow, and produce a new colony like the parent animal.

The *actinia* feed upon *medusæ*, and other small crustaceous and molluscous animals and fishes, which they seize with their tentacula, and afterwards disgorge what they cannot digest. They are found in every sea, some suspended from the vaults of sub-marine reefs, others covering the more exposed sides of rocks with a sort of flower-like tapestry, and some confining themselves to the smooth sands, on the surface of which they spread out their tentacula, and even withdraw under the sand when danger threatens. Each species, indeed, generally selects a peculiar haunt. With the exception of the green species (*Actinia viridis*, Forskal), none of them sting when touched in the manner of the *medusæ*.

Many of the species are used as food in tropical countries, on whose coasts they are more numerous than in colder climates. Of those found in a submarine rock-basin at Barbadoes, we have a curious account by Hughes, in his Natural History of the Island.

'In the middle of the basin,' he says, 'there is a fixed stone or rock, which is always under water. Round its sides, at different depths, seldom exceeding eighteen inches, are seen, at all times of the year, issuing out of little holes, certain substances that have the appearance of fine radiated flowers, of a pale yellow, or a bright straw colour, slightly tinged with green, having a circular border of thick-set petals, about the size of, and much resembling, those of a single garden marigold, except that the whole of this seeming flower is narrower at the discus, or setting on of the leaves, than any flower of that kind.

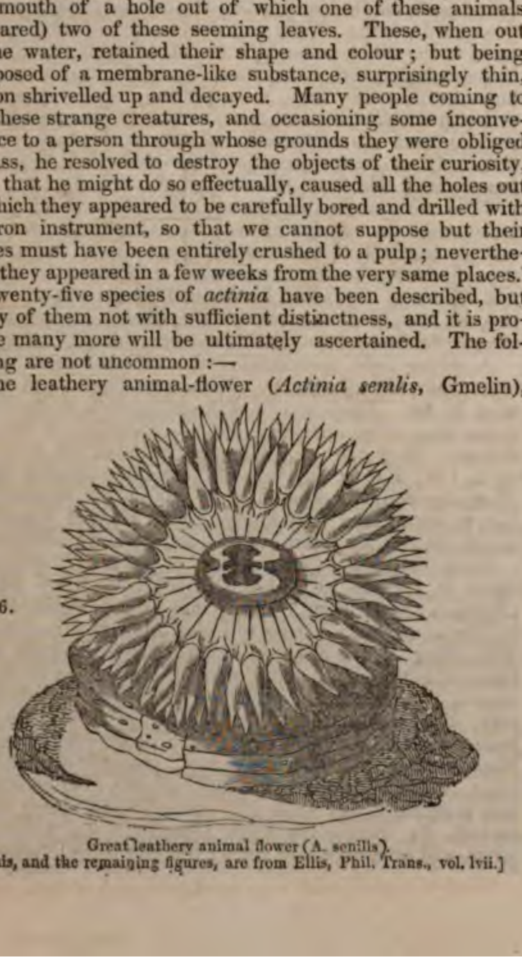
'I have attempted to pluck one of these from the rock, to which they are always fixed; but never could effect it: as soon as my fingers came within two or three inches of it, it would immediately contract close together its yellow border, and shrink back into the hole of the rock; but, if left undisturbed for about four minutes, it would come gradually in sight, expanding, though at first very cautiously, its seeming leaves, till at last it appeared in its former bloom. However, it would again recoil, with a surprising quickness, when I came within a little distance of it. Having tried the same experiment, by attempting to touch it with my cane and a small slender rod, the effect was the same.

'Though I could not by any means contrive to take or pluck one of these animals entire, yet I once cut off (with a knife which I had held for a long time out of sight near the mouth of a hole out of which one of these animals appeared) two of these seeming leaves. These, when out of the water, retained their shape and colour; but being composed of a membrane-like substance, surprisingly thin, it soon shrivelled up and decayed. Many people coming to see these strange creatures, and occasioning some inconvenience to a person through whose grounds they were obliged to pass, he resolved to destroy the objects of their curiosity, and, that he might do so effectually, caused all the holes out of which they appeared to be carefully bored and drilled with an iron instrument, so that we cannot suppose but their bodies must have been entirely crushed to a pulp; nevertheless, they appeared in a few weeks from the very same places.'

Twenty-five species of *actinia* have been described, but many of them not with sufficient distinctness, and it is probable many more will be ultimately ascertained. The following are not uncommon :—

The leathery animal-flower (*Actinia senilis*, Gmelin), which is three inches broad, with a leathery, unequal envelope of an orange colour; the tentacula in two rangs, usually marked with a rose-coloured ring. Its abode is usually in the sand.

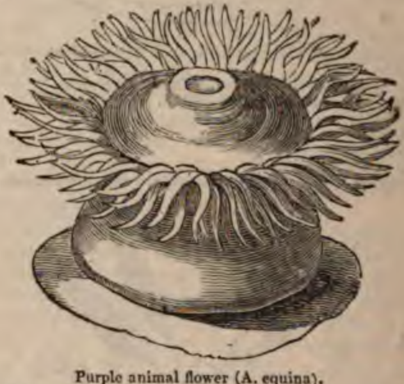
Fig. 6.



Great leathery animal flower (A. senilis).
[This, and the remaining figures, are from Ellis, Phil. Trans., vol. lvii.]

The purple animal-flower (*Actinia equina*, Dicquemare), which has a soft skin, finely striated, usually of a beautiful purple, often clouded with green. The tentacula, to the number of a hundred, vary much in colour. When the tide retires, this species may be seen ornamenting the sea-rocks with its beautiful colours—'purple, violet, blue, pink, yellow, and green, like so many flowers,' says M. Lamouroux, 'in a meadow.

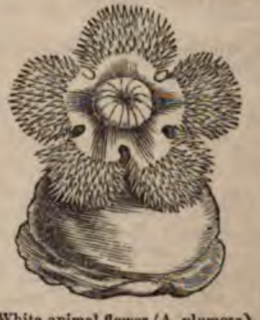
Fig. 7.



Purple animal flower (A. equina).

The white animal-flower (*Actinia plumosa*, Cuvier) is four or more inches broad, of a white colour; the margins of the mouth expanded into lobes, all furnished with innumerable tentacula. There is an inner row of these, still larger.

Fig. 8.



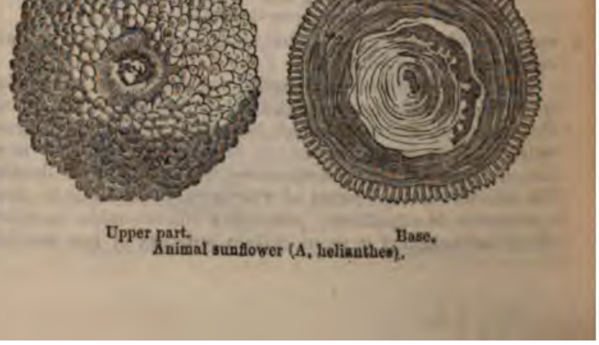
White, animal flower (A. plumosa).

The brown animal-flower (*Actinia effœta*) is of a clear brown, radiated lengthwise with white, and of a longish shape, often contracted at the base. The skin is glistening; the tentacula numerous. When it contracts itself there frequently issue from the mouth long filaments, which come from the egg organs (*ovaria*). It attaches itself chiefly to shells, and is very common in the Mediterranean.

The carnation animal-flower (*Actinia Jordaica*, Linnæus) has very numerous tentacula, which are of a deep crimson, and, when expanded, give the animal the appearance of a fine double carnation. The inhabitants on the shores of the Mediterranean, particularly the Italians, esteem this species as very delicate for the table.

Dr. Rüppel has recently divided from the other *actinia* those whose tentacula are branched (*Thalassiantha*, Rüppel), and those whose tentacula are so short as to be scarcely obvious (*Discosoma*, Rüppel).

Fig. 9.



Upper part. Base.
Animal sunflower (A. helianthes).

ACTI'NOLITE, a crystallized mineral of a green colour, a variety of hornblende, found in primary stratified rocks, and occasionally in trap-rocks. The name is derived from ἀκτίν (*actin*), a ray of light, and λίθος (*lithos*), a stone, from the crystals being arranged in the form of rays.

ACTION (in law) is the mode of proceeding by which a man seeks to recover, through the intervention of the law that which is legally due to him: it has been defined by some ancient writers to be 'a lawful demand of one's right;' and by others, 'the right of a man to prosecute by a judicial proceeding that which is his due.' The general object of actions is to put a party into possession of a right of which he has been injuriously deprived by another. This may be effected, where lands or goods are wrongfully withheld, by the actual delivery of them to the legal proprietor; but in the case of assaults, slander, breaches of contract, or other personal wrongs, the only possible remedy is to award to the sufferer a pecuniary compensation for the injury he has sustained. By the law of England, certain specific forms are appointed in which legal remedies are to be enforced in the infinite variety of disputes and controversies arising between individuals. The various modes and instruments by which those remedies are pursued and obtained are, in popular language, called actions or suits. The principle of the law of England that for every wrong sustained by an individual there should be a remedy, does not, however, apply universally. Where the wrong is of such a nature that the detriment to the public is of more consequence than the injury to the individual, it becomes the subject of a criminal prosecution; and no right of action exists in the injured party for the remedy of his private wrong, until the offender has been tried and undergone punishment as a criminal. For those wrongs in general done by one individual to another, which do not amount to legal crimes, the proper remedy is by *action*.

Actions in England are usually divided into three kinds, according to the subjects of them; viz. real, personal, and mixed.

Real actions are so called because they exclusively refer to real property, or subjects connected with land. The law regards this as the highest kind of property, and distinguishes it from all other or *personal* property by the name of *real*. Real actions are brought for the recovery of lands or tenements, rents, advowsons, or other hereditaments. Real actions were, in the earlier periods of the history of English law, of constant and daily occurrence; and our ancient books of reports are principally occupied with cases in pleas of land, which, before the country had attained to commercial importance, was the most valuable and ordinary species of property, and, consequently, the most fruitful source of litigation. From the nicety and inconvenient length of the process they are at the present day almost entirely discontinued; and more simple and expeditious modes of trying titles to land by mixed and personal actions are generally introduced.

Personal actions are by far the most numerous class of actions. It is by them that the innumerable differences respecting debts, promises, and contracts are settled; and that compensation is sought for personal insults and injuries of almost every description, including even some of the minor crimes and misdemeanours, which thus become punishable both as crimes and as civil injuries.

Mixed actions partake of the nature of both the former actions, being brought for the recovery of lands, and also for personal damages,—either for some injury done to the land, or some other wrong, such as the illegal detention of it from the proper owner. The action of waste is a good example of this; the owner of the inheritance brings his action against the tenant for life who has committed waste on the land by cutting down trees or otherwise. In this action, he not only recovers the place upon which the waste was committed (which if it were the only effect would make it a *real* action), but by the statute of Gloucester he is entitled to treble damages as a *personal* compensation for the injury done to the land; and thus both kinds of action being joined together, give to the compound the denomination of a *mixed* action.

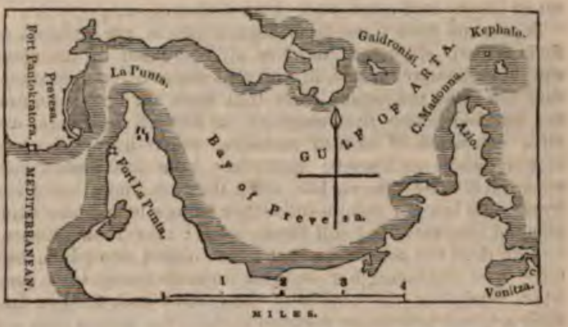
The outline of the general course of proceedings in an action at law is as follows:—The injured person (called the plaintiff) obtains a *writ* against his adversary (the defendant), who, upon being taken by virtue of the writ, gives *bail* in order to secure his appearance at the trial. When this is done, the plaintiff makes a written statement or *declaration* of the ground of his action, and prays to be restored to his right, or compensated for the injury which he alleges himself to have sustained. The defendant then *pleads*, i.e. answers the declaration by contradicting the allegations contained in it; asserting his own right, or justifying his conduct: to this the plaintiff may reply; and thus the parties may continue to altercate in legal language, or special pleading, until one or more material questions of fact are distinctly asserted by one party and denied by the other. These questions, which are called the *issues* in the cause, are then to be tried by the jury, who, after hearing the *evidence* of both parties, give their *verdict* either for the plaintiff or defendant. In pursuance of this verdict, the *judgment* is pronounced by the judges of the court to which the proceeding belongs, and the judgment is *executed* by the sheriff or other proper officer.

For more particulars respecting actions, see Bacon's *Abridgment*—Viner's *Abridgment*—Comyn's *Digest*—Jacob's *Law Dictionary*.

A'CTIUM, a point of land at the entrance of the Ambraciot bay, now the gulf of Arta, which derives its chief importance from the sea-fight which took place near it in the bay of Prevesa, between Cæsar Octavianus, afterwards the Emperor Augustus, and Marcus Antonius, B.C. 31. The latter was completely defeated, and fled with his mistress Cleopatra, who was present at the engagement, into Egypt.

The conqueror, to commemorate his victory, beautified the temple of Apollo which stood at Actium, and erected NICOPOLIS, or 'the city of victory,' on the northern side of the gulf, a few miles from the present city of Prevesa. In the article 'Achæa' we stated that Tacitus includes Nicopolis in the limits of the Roman province of Achæa; and of course Actium also would be comprised within the same political division. We find it still impossible to fix the northern limits of Achæa with accuracy; but we may here remark that what we called the Roman province of Epirus was probably contained within the limits of the extensive government of MACEDONIA.

The exact site of Actium has been a subject of dispute, some placing it at La Punta, or Fort La Punta, and others at Azio, as represented in the accompanying plan, which is taken from a very recent survey. The plan shows only part of the gulf of Arta (see ARTA). The name Azio would appear to favour the supposition of this point being the ancient Actium, but it is merely a Venetian term, probably given through some misunderstanding as to the locality of Actium. Strabo says that Actium is that point which forms one side of the entrance of the bay, and it is also clear from what he further says, that he considered the entrance of the bay to be between Prevesa and fort La Punta. He also gives to this passage a width of a little more than four stadia, or half a mile, which appears from the plan to be true when applied to the first narrow entrance, but not to the second. Anactorium, a place about four miles from the temple of Apollo which stood at Actium, is described by Strabo as 'situated *within* the bay,' while Actium 'makes the mouth of the bay.' According to this statement Actium is La Punta, and Cape Madonna is at or near Anactorium. To make it still clearer to his readers, Strabo, after describing the coast *northwards* of the entrance of the bay, comes to the *entrance* itself, following the line of coast, and this word *entrance* can only be applied to the strait of La Punta. 'Near the entrance on the right,' says Strabo, 'is the sacred place of Apollo of Actium, an eminence with a temple on it, and below, a plain with a grove of trees and a dock-yard;'



This description is said by some to suit C. Madonna better than La Punta, because Madonna is high and Punta low. But Strabo says the temple is on an eminence, and this eminence some distance from the sea; he does not say that the temple was on an eminence, which eminence was on the sea.

Actium is a name derived from a Greek word *acte*, which, in a geographical sense, is worth explaining. An *acte* is a piece of land projecting into the sea, and attached to another larger piece of land, but not necessarily by a narrow neck. Thus, the projecting land on which La Punta and C. Madonna stand can both have the name of *acte*. Herodotus calls Asia Minor itself an *acte* compared with the whole of Asia; and Africa itself (which he believed to be much smaller than it is) an *acte*, projecting from the mass of Asia.

ACTIVE MOLECULES, in plants, are extremely minute, apparently spherical, moving particles, found in all vegetable matter when rubbed in pieces and examined under very powerful microscopes. In size they vary from the $\frac{1}{15000}$ to $\frac{1}{30000}$ of an inch in diameter, and are only to be detected with lenses capable of magnifying at least 300 diameters. Viewed under favourable circumstances, immersed in water, and with transmitted light, they are seen to have a rapid motion of an oscillating nature, so that a minute drop of the fluid in which they swim seems to be as it were alive. In the pollen of plants they are extremely numerous, and perfectly distinct from each other, so that a grain of pollen crushed in water is one of the best subjects for the observer to select; he will there find the active molecules mixed with oblong or cylindrical particles, of a larger size, and equally in motion; the latter are the spermatic granules, by the agency of which the fertilization of plants probably takes place, as will be hereafter explained under the article POLLEN. To find the active molecules in other parts of plants, it is necessary that they should be crushed and rubbed in water till it becomes greenish; a drop of the coloured fluid will be found to contain vast numbers of these molecules moving about with great rapidity and exhibiting every appearance of animal life. Curious as these circumstances undoubtedly are, it is still more singular that the movements of the molecules do not cease with the life of a plant; on the contrary, they have been witnessed by Dr. Brown even in the fossilized remains of vegetables, and may be readily seen by colouring water with the dead vegetable matter called Gamboge, when the molecules are instantly set at liberty and commence their motions.

It appears from these facts that if plants are reduced to their organic elements, they are all composed of the same simple molecular matter, in different states of combination; that the huge mahogany trees that form our furniture, and the humble lichen that encrusts our ancient buildings, are alike composed of similar particles, which are capable of motion when at liberty; that they lose that power, and apparently their separate life, when they are combined by the irresistible laws of nature into other beings of a more complicated structure, but still forming life; that their inherent vitality does not cease with that of the object into which they have been combined, but endures through many ages even when buried in the bowels of the earth; and, finally, that their original powers are restored to them the instant they are liberated from their prison.

It has been thought by some, that the motions above described could be accounted for by evaporation, or by the unstable equilibrium of the molecules in the fluid in which they are suspended, or by currents in the fluid, or by a slow but gradual dissolution of the molecules, or by attractions and repulsions among the molecules themselves; but it is difficult to reconcile with such hypotheses the following ingenious experiments of Dr. Brown, the great observer of these phenomena, to whom the world is indebted for the most accurate information upon the subject. Take a drop of water in which a small quantity of the molecules is known to be floating; mix it well, by shaking it violently, among a much larger quantity of almond oil; the water will then be divided into extremely minute globules, each of which will be inclosed in a coating of oil; if the smallest of the globules, thus obtained, be examined, they will be found to contain two, or three, or even one only of the molecules, caught, as it were, in a trap, where they may be kept for many weeks and observed. Under such circumstances, no alteration whatever can be discovered in their movements, which continue the same as before the water in which they float was *ted with oil. The inversion of* this experiment by mixing a small quantity of oil, in like manner, among a large quantity of water, produces drops no bigger than the molecules themselves; but these drops, when mixed with the molecules and observed under precisely the same circumstances, exhibited no movements whatever.

For further information upon this subject, see Brown's *Account of Microscopical Observations*, made in June, July, and August, 1827.

ACTON, JOSEPH, the prime minister of the court of Naples for several years, was the son of an Irish gentleman who practised medicine at Bensançon, in France. He was born in 1737. He was originally in the French naval service; but subsequently obtained the command of a frigate from Leopold, Duke of Tuscany. In an unsuccessful expedition against Algiers, in 1774, in which the government of Tuscany co-operated with that of Spain, Acton commanded the Tuscan vessels; and by his gallant conduct succeeded in saving three or four thousand Spanish soldiers, who must otherwise have perished. His good conduct here was the cause of his advancement. He was recommended to the service of the king of Naples. His intriguing disposition secured him the favour of the king and queen of Naples; and he was successively minister of the navy, of war, of finance, and ultimately became prime minister. In his policy he was constantly opposed to the French party in Italy. Many of the persecutions for political opinions, and the violations of justice, which occurred at Naples subsequent to the period of the French invasion, in 1799, are ascribed to the power or the influence of Acton. He is said to have died in obscurity in Sicily, in 1808.

ACTOR and ACTRESS.—[See DRAMA.]

ACTS OF SEDERUNT (in the municipal law of Scotland) are statutes made by the Lords of Session, by virtue of a Scottish Act of Parliament, passed in 1540, empowering them to make such constitutions as they may think expedient for ordering the procedure and forms of administering justice. These are called Acts of *Sederunt* because they are made by the Lords of Session *sitting* in judgment.

ACTS of the APOSTLES.—[See APOSTLES.]

ACTUARY, a word which, properly speaking, might mean any registrar of a public body, but which is generally used to signify the manager of a joint-stock company under a board of directors, particularly of an insurance company; whence it has come to stand generally for a person skilled in the doctrine of life annuities and insurances, and who is in the habit of giving opinions upon cases of annuities, reversions, &c. Most of those called actuaries combine both the public and private part of the character.

An actuary combines with the duties of a secretary those of a scientific adviser to the board which gives him his office, in all matters involving calculation, on which it may be supposed that the members of the latter are not generally competent to form opinions themselves.

The name has a legal character from its being recognized in the statute 59 Geo. III. c. 128 (or the Friendly Societies' Act of 1819), which enacts that no justice of the peace shall allow of any tables, &c., to be adopted in any Friendly Society, unless the same shall have been approved by 'two persons, at the least, known to be professional actuaries, or *persons skilled in calculation*,'—a definition much too vague to be any sufficient guide. The Committee on Friendly Societies of 1825 reported that 'petty schoolmasters or accountants, whose opinion upon the probability of sickness and the duration of life is not to be depended upon,' had been consulted under this title, and recommended that the actuary of the National Debt Office should be the only recognized authority for the purposes above-mentioned; in which recommendation the Committee of 1827 joined. In the 10 Geo. IV. c. 56, however, no alteration appears in the law on this point. We may further mention that, by the Act of 1819, no Friendly Society can be dissolved, or any division of money made otherwise than in the ordinary course, without the certificate of two actuaries, that the interests of all the members have been consulted in the proposed dissolution or payment.

ACU'LEUS, or PRICKLE, in Botany, is a hard, conical, often curved, expansion of the bark of some plants, such as the rose, and is intended either for their defence against enemies, or to enable them to hook themselves upon their neighbours, so as to gain a more free access to light and air, or for other purposes unknown to us. The prickle is composed entirely of cellular tissue, which is at first soft and flexible, and only acquires its hardness and rigidity when old. In some respects it may be compared to a hair, from which it chiefly differs in its large size and greater permanence. Care must be taken by the young botanist not to confound the prickle with the spine or thorn, which is of a totally different nature. [See SPINE.] They may be distinguished by the prickle breaking readily from the bark, leaving a clean scar behind; while the spine cannot be torn off without rending through the bark into the wood itself. Leaves are often metamorphosed into spines, but never into aculei. [See METAMORPHOSIS OF PLANTS.]

ACUPUNCTURE, a term used to denote the insertion of a needle into the skin or flesh. Acupuncture is an operation which has been long in use in eastern countries, and which appears to have been adopted there from the notion that several diseases attended with severe pain arise from air or vapor pent up in the body, to which a puncture with a needle affords an outlet, and thereby removes the malady. Europeans travelling in those countries several times witnessed the practice, and were struck with the results; but either their reports were not credited, or the operation appeared to the physicians and surgeons of Europe so unpromising, that upwards of a century elapsed after the knowledge of it was familiar to many European practitioners, before a single trial of it was made. As long back as the year 1679, a medical officer in the East India Company's service states that a guard of the Emperor of Japan, appointed to conduct the English to the palace, was seized with violent pain of the abdomen, attended with vomiting, in consequence of having drank a quantity of iced water when heated. After trying in vain to relieve his complaint by taking wine and ginger, and conceiving that his suffering arose from air or vapor pent up in the walls of the abdomen, to which vapor the insertion of needles into the skin would afford an exit, he underwent the operation of acupuncture in the presence of the narrator, which was performed in the following manner:—He laid himself upon his back, placed the point of a needle upon his abdomen, struck its head with a hammer once or twice to make it pass through the skin, turned it round between the forefinger and thumb till it entered to the depth of an inch, and then, after about thirty respirations, withdrew it, and pressed the punctures with his fingers, to force out the imaginary vapor. After having made four such punctures, he was instantly relieved, and got well. Some years afterwards, a physician, who accompanied a Dutch embassy to Japan, confirmed this account, by the statement that the Japanese are in the constant habit of performing this operation in various disorders attended with acute pain, and that he himself frequently witnessed the instantaneous cessation of the pain as if by enchantment. No further notice appears to have been taken of this mode of treatment in Europe for upwards of a century, when it was alluded to by the celebrated Vicq-d'Azyr, in the Encyclopédie Méthodique, merely for the purpose of congratulating the world that the statements of Ten Rhyne and Kæmpfer, the physicians who had given the first accounts of it, had not induced any European physician or surgeon to practice it. In the year 1810, however, some trials of it were made by Dr. Berlioz, a physician of Paris, who found, or fancied he found, it so efficacious a remedy, that he was induced to employ it very extensively, and many French practitioners imitated his example with the same apparent results. It has been subsequently tried in England, and sufficient experience of it has now been obtained to prove that the operation itself is attended with little or no pain, and that it may be employed at least with safety, if not with advantage.

There are two cases in which it seems likely to be beneficial,—first, in painful local affections unattended with change of structure in the part diseased, and without local inflammation or general fever,—and, secondly, in that species of dropsy termed anasarca, in which the water is accumulated in the cells of the cellular membrane that lies immediately beneath the skin. It is probable that all the cases of the first class consist of disordered states of the nerves of the parts affected, technically termed cases of NEURALGIA. There cannot be a question that this remedy has proved beneficial in cases of this kind sufficiently often to warrant the trial of it, whenever these disorders do not yield to the ordinary modes of treatment, and under these circumstances there is the greater reason for resorting to it, since the operation occasions no pain, and since no evil consequence of any kind has ever been known to result from it. But if the part affected be inflamed, and more especially if there be any degree of febrile action in the system, the acupuncture of the part will certainly do no good, and will very likely produce mischief.

In anasarca a few punctures made with the needle will allow a ready exit to the fluid, which may continue to drain during several days in succession; and when this is the case, it invariably affords relief, and sometimes saves, and oftener prolongs, life. Scarification is a remedy of the same kind in ordinary use, but the inflammation that results from this practice is sometimes severe, and occasionally runs into mortification. Acupuncture is affirmed by many who have made trial of it to be equally effectual, and to be much less apt to be attended with these evil consequences.

The needles employed in oriental countries are always made of the purest gold or silver; those of gold are preferred, and great care is taken to obtain them well tempered. In China their manufacture is a distinct occupation, understood by few, and those few are licensed by the emperor. Some of these needles are fine, about four inches in length, with a spiral handle, for the purpose of more easily turning them, and are kept by means of a ring, or a piece of silk thread, in grooves, each capable of holding one needle: the grooves are formed in each side of a hammer, usually made of the polished horn of the wild ox, ivory, ebony, or some other hard wood; the hammer is rather longer than the needle, and has a roundish head, covered on the side that strikes with a piece of leather, and rendered heavier by a little lead within. The needles employed in Europe are of steel, long and fine, and furnished either with a knob of sealing-wax at their head, or, what is more convenient, a little handle of ivory or wood, screwing into a sheath for the needle. They are best introduced by a slight pressure, and a semi-rotating motion, between the thumb and forefinger, and withdrawn with the same motion. In cases of neuralgic pain the needle should be allowed to remain in from a quarter of an hour to two hours. It would appear, that in cases of this kind, a number of needles introduced, and hastily withdrawn, is not as effectual as the introduction of a single needle that is allowed to remain for the space of a couple of hours. When the only object is to afford an exit to the fluid collected in anasarca, of course the mere puncture is sufficient; there is no use in allowing the needle to remain.

AD LIBITUM (Latin, or *ad lib.* in Music), *at discretion, at pleasure,* denotes that the performer is at liberty to pause, or to introduce any cadence or addition of his own, according to his judgment. An accompaniment is said to be *ad libitum,* when it is not essential, and may be either used or omitted, as circumstances may require, without materially affecting the composition.

ADA'GIO, in Music, an Italian adverb, signifying *slowly, leisurely,* and used to indicate the slowest movement in music: though some writers, and among them Rousseau, have ranked *Largo* as a degree slower; but an examination of the works of those who were the earliest to use both terms, as well as of the practical interpretation of the best and most correct composers, will be sufficient to shew the error.

It is now, and has long been, the custom to point out the quickness or slowness, as also the manner or character, of a piece of music, by some Italian word, placed at the beginning of the composition. These are sometimes very inadequate to the purpose, and much is commonly left to the judgment of the performer, which but too frequently cannot very safely be relied on. The use of the metronome [see METRONOME], or, indeed, of any other kind of pendulum, which is gaining ground in spite of prejudice, fixes the intention of the composer as regards movement, that is to say, quickness or slowness. With respect to style, to the passion meant to be expressed, much must still depend on the taste and intelligence of those to whom the execution of a work is entrusted.

The five principal terms denoting the degrees of motion, beginning from the slowest and proceeding to the quickest, are—

Adagio, very slow.
Largo, slow.
Andante, a moderate time.
Allegro, quick.
Presto, very quick.

Other terms relating to slowness or quickness, are but modifications of the above.

The word *Adagio* is also used substantively · thus we say, an *Adagio* of Haydn.

The real knowledge and taste of a performer is best developed in his mode of treating an *Adagio*. What is commonly called execution, or the rapid motion of the fingers, is purely mechanical, and demands neither sensibility nor discrimination; it is a kind of sleight-of-hand, which any one by dint of animal labour may acquire: but to give true effect to a slow movement, the performer must, in addition to considerable experience and a pretty extensive acquaintance with the best schools of music, possess strong feeling, must play, or sing, with 'the same spirit that the author writ,' or he will find no willing hearers. In a word, he will either charm or disgust his audience; will shew that he either understands his art, or is wholly incapable of attaining its highest object, namely, that of touching the heart.

ADAM, the first man, and progenitor of the human race, whom God formed of the dust of the ground, on the sixth and last day of the creation, as related in the first and second chapters of Genesis. The whole of the authentic history of Adam is contained in the first five chapters of that book. His loss of the state of innocence and felicity which he originally enjoyed, is commonly known by the name of *the Fall*. It was after this event, and his expulsion from the Garden of Eden, or the terrestrial Paradise, that his eldest son Cain was born. His second son was Abel, and his third Seth, or Sheth, who was born when he was a hundred and thirty years old. But he is also stated to have had other sons and daughters, whose names are not given. He died at the age of nine hundred and thirty, and therefore, according to the commonly received computation, in the year 3074 before the birth of Christ. Many fables have been invented, and idle questions raised, by the rabbinical writers and others, respecting Adam, for which there is no warrant whatever in Scripture. The reader who may be curious to see some of these may consult the articles in Bayle, and in Calmet's Dictionary of the Bible. The word *Adam* means 'to be red,' and it is supposed that in allusion to the signification of this Hebrew verb, the earth out of which Adam was made was called 'Adamah;' while others think that the name 'Adam' contains an allusion to the reddish colour of a healthy person. See the use of the word 'adom' in the *Song of Solomon*, v. 10. According to Ludolf, *Adamah*, in the Ethiopic, means 'beautiful, elegant,' &c.; denoting man to be the chief work of God. In the New Testament the expression, the New Adam, is frequently used to designate our Saviour.

ADAM, ALEXANDER, LL.D., a late eminent teacher of Latin, who was born in June 1741, at Coats of Burgie, in the parish of Rafford, Morayshire. The station of his parents was very humble, but the parish school enabled them to obtain for their son the rudiments of a good education, at an expense not beyond their scanty means. After having acquired the ordinary knowledge of Latin here, young Adam proceeded to Aberdeen, in the hope of obtaining one of the small exhibitions, or bursaries, which are open for annual competition at King's College, to persons proposing to become students at that seminary. In this expectation, however, he was disappointed. He then resolved to enter himself at the University of Edinburgh, and to trust to his own exertions and fortitude to enable him to struggle through the usual course. This was in the winter of 1758. His difficulties and privations while attending college were very great; but he was of a character well fitted to contend with the hardships which it was his lot to encounter; and though he was sometimes reduced to such destitution as not to know where to obtain a mouthful of bread, he manfully persevered in hard study till he gained the reputation of being one of the best scholars in the university. His merits were at length rewarded by his appointment, in 1761, to the office of one of the teachers in Watson's Hospital, an institution in Edinburgh for the education and support of the sons of decayed burgesses. This situation he held till 1767, when the ability and success with which he had discharged its duties caused him to be chosen assistant to the Rector of the High School, the chief classical seminary of the city. Finally, in 1771, on the death of the rector, Adam was elected by the magistrates as his successor; and in this honourable post he remained throughout the rest of his life. The first years of his rectorship, however, were somewhat stormy. In 1772 he published a little work, entitled 'The Principles of Latin and English Grammar,' and he introduced it into the school as a substitute for Ruddiman's Grammar, which had been for many years the established manual. The four under-masters resisted this innovation, and at last the dispute grew to such a height, that it became necessary for the magistrates, as patrons of the school, to interfere. The proceedings which took place are very fully detailed in Chalmers' Life of Ruddiman (pp. 91-96, and 390-403). From the statement there given, it appears that the matter was first submitted to the town-council by the Lord Provost, on the 2d of February, 1785, when it was resolved to refer it to the decision of the Principal, and two of the Professors of the University. These learned persons took due time for deliberation, and on the 15th of October drew up a report, recommending that Ruddiman's should be the grammar regularly used in all the classes, but permitting the rector to introduce into his own class such additions from the rival work as he might deem necessary or proper. This decision, however, it would appear, did not settle the dispute. On the 7th of November we find the business again brought before the magistrates by a remonstrance from the under-masters against the decision of the professors, and a petition that the old grammar alone should be tolerated in the school. The magistrates, thus again appealed to, did not pronounce their judgment with precipitation; but at length, on the 23d of August, 1786, they issued an explicit prohibition against the rector's book, in conformity to the under-masters' prayer. Adam now in his turn became the remonstrant; but a letter which he wrote only produced a second order from the town-council, on the 29th of November, repeating and confirming the former. After this he no longer attempted to teach from his own grammar; and although the book has since gone through several editions, it has not supplanted Ruddiman to any great extent in the other schools of Scotland. Dr. Adam also published the following works:—In 1791 a volume entitled 'Roman Antiquities,' which has gone through several editions, and been translated into German, French, and Italian; in 1794, a 'Summary of Geography and History,' also several times reprinted; in 1800 a Dictionary of Classical Biography; and in 1805 a Latin Dictionary, under the title of 'Lexicon Linguæ Latinæ Compendiarium,' being an abridgment of a larger work, on which he had been long engaged. A second edition of this last has been published since the author's death, with very considerable alterations, both in the way of addition and of curtailment. Both this dictionary and the Roman Antiquities are much used in the schools of Scotland. No person filling a public situation was more universally respected and esteemed in Scotland than Dr. Adam in his latter days. His character was one of great manliness; so much so as to make him sometimes perhaps indiscreetly bold in the expression of whatever he felt. His political opinions were of a strongly liberal complexion; and he has been accused of not scrupling sometimes to give them vent with considerable emphasis in the presence of his class. But such was the general regard which was felt for him, that this charge which, especially at the time when it was made, would have seriously injured almost any other schoolmaster, scarcely affected his influence or usefulness. He was carried off by apoplexy on the 18th of December, 1809, in his sixty-ninth year, and was honoured by his fellow-citizens with a public funeral. A memoir of his life was published in 8vo., in 1810.

Of the four works just enumerated, the most valuable and the best known is the treatise on Roman Antiquities. Few books in so small a compass contain so large a mass of useful information, and the matter, multifarious as it is, is in general well digested and arranged. The chief defect perhaps, and it is one which pervades many parts of the work, is an inattention to the effects of time in changing the customs of the Romans. If the habits of one people differ from those of another, no less distinct is the character of the same nation at distant periods of its existence. While the distribution of political power and the signification of political terms vary on the one hand, on the other, the whole face of private life is changed by revolutions equally complete. Thus, though Dr. Adam has collected a large mass of facts connected with the political institutions of Rome, yet, not perceiving how the meaning of terms varied in the different ages, he has often so arranged the passages extracted by him from Latin authors on this subject, as entirely to mislead both himself and his reader. Indeed, when Dr. Adam wrote, the whole of this department of Roman Antiquities was one confused chaos, which has been only reduced again to order by the extraordinary talent and learning of Niebuhr and other writers. Again, some corrections and many additions are required in the section on the Roman year, particularly for the periods prior to the Julian correction. No little caution, also, should be observed in reading the remarks on Roman money, a subject of especial difficulty, in which it is often more prudent to be satisfied with ignorance, than to adopt the ordinary interpretations. The value and names of the Roman coins were constantly changing, and this not consistently. Secondly, the numerical notation employed by the Romans is particularly liable to corruption in the MSS.; and, even where the text is not corrupted, the interpretation is uncertain. Some other defective parts might easily be pointed out. Yet, with all these drawbacks, the work is of great value to all who read the history or the literature of Rome, and does great credit to Dr. Adam. It ought not to detract from his reputation that he has not anticipated the important discoveries made by the Germans in the last twenty years; but undoubtedly it is to be desired, and none would have desired it more than Dr. Adam himself, that the substance of these discoveries should now be incorporated in the work, in the place of what is defective or erroneous.

The treatise on Classical Biography is intended chiefly for the illustration of Roman History, and within these limits has a decided superiority over any other work in our language. It deserves a much more extensive circulation than we believe it possesses in England. And we may say the same of Dr. Adam's Latin Dictionary, which has been prevented from superseding the octavo edition of Ainsworth's Dictionary, perhaps only by the inconvenient arrangement adopted by Adam, who often neglects the alphabetical order, to bring together words etymologically connected. The summary of History, and Geography, published by Dr. Adam, has in parts great merit, but it aims at much more than can be fairly executed within the limits. We need only say that it professes to give, 1st, A summary of all history, ancient and modern, Grecian, Roman, Persian, English, French, German, Indian, American, &c., &c., with the manners and customs of these nations; 2dly, The mythology of the Greeks; 3dly, The geography of all ages and all countries, not excluding even the local situations of remarkable cities; 4thly, An account of the progress of astronomy and geography, from the earliest periods to the present time, with a brief account of the planetary system. And not satisfied with all this, the publishers have added an extensive index of geography, and thirteen maps of little value. Bulky as the volume is, there is not, and cannot be, room for information of any value, on so many points. Like a map on a small scale crowded with names, its tendency is to confound rather than inform the understanding. But when we look at all that Dr. Adam did, we can fairly say that no writer in the British islands has ever done more to assist the young student of Latin, or, what is perhaps still more important, to connect that study with the attainment of general knowledge.

ADAM, JAMES, an architect of the last century, who is not at all known but as the partner and associate of his brother Robert, the subject of the following article. He died in 1794.

ADAM, ROBERT, an architect who was extensively employed both in England and Scotland, but more particularly in London, in which city he also engaged in some very considerable building speculations. He was born at Kirkaldy, in Fifeshire, according to some authorities, and, according to others, at Edinburgh, in the year 1728, and was the son of William Adam, Esq., of Maryburgh, near Kirkaldy, who is said to have furnished the designs for Hopetoun House and the Royal Infirmary of Edinburgh; but whether he was himself professionally an architect or not, does not appear. Robert received his literary education at the University of Edinburgh; and, from his father, it seems most likely, he derived instruction in the principles and practice of his future profession. During this period he had the advantage of the society of many distinguished literary and scientific men, who were the friends and companions of his father, and among whom were numbered the great names of Hume, Robertson, and Adam Smith.

When he was in his twenty-sixth year, Mr. R. Adam went to Italy in pursuit of professional knowledge, and remained there several years. His contemporaries, James Stuart and Nicholas Revett, were, at the time of Adam's residence in Italy, engaged in exploring, and preparing for publication, the architectural remains of Athens; but so little was Grecian architecture known and appreciated, that he went, instead, to Spalatro in Dalmatia, to measure and delineate the ruins of the palace of Diocletian there, a structure indicating alike the decline of civilization and the progress of barbarism. In this tour he was accompanied by Clérisseau, a French architect, whose name is connected with a work on the remains of a Roman temple at Nismes, in Languedoc. Mr. Adam returned from the continent about the year 1762, and settled in London, and shortly after published there, in a large folio volume, engraved representations and descriptions, with attempted restorations, of the Dalmatian palace before mentioned. These, like many other attempts of the kind, are not consistent, in the more important particulars of architectural arrangement, with the evidence afforded by the remains themselves, and by the remains of other palatial and domestic edifices of the same and earlier date; some of these, however, were not accessible when Mr. Adam wrote.

About the same time, 1763-4, Mr. R. Adam was appointed architect to the king. This fortunate position made him what is termed fashionable, and he found extensive employment. In the course of a very few years he designed, and, in conjunction with his brother James, executed a great many public and private buildings in England and in Scotland. In 1773 the brothers commenced the publication of their works, in large folio engravings, with letter-press descriptions and critical and explanatory notes, in numbers, which were continued at intervals down to 1778. The principal designs included in these are, the screen fronting the high road, and the extensive internal alterations of Sion House, a seat of the Duke of Northumberland, near Brentford in Middlesex; Lord Mansfield's mansion at Caen-wood, or Kenwood, also in Middlesex; Luton House, in Bedfordshire, erected for Lord Bute; the screen to the Admiralty Office, London; the Register Office, Edinburgh; Shelburne House, now Lansdowne House, Berkeley-square, London; the parish church of Mistley, in Essex, &c. &c. At a later period the Messrs. Adam designed the infirmary at Glasgow, and some extensive new buildings in the University of Edinburgh, though their practice, after the year 1780, lay principally in London, where a great many of their productions still exist, and are easily recognised by any one accustomed to discriminate architectural design. We may mention Portland, Stratford, and Hamilton Places, the south and east sides of Fitzroy Square, and the buildings of the Adelphi as the most extensive of their works. Much of what the Messrs. Adam did was in the capacity of speculating builders. The Adelphi was a speculation of their's, and is understood to have been an unsuccessful one. The substructions of buildings of such a kind, and in such a situation as those of the Adelphi Terrace, were necessarily so expensive as almost to preclude the possibility of an adequate return. It may be further remarked that their interest in, and connexion with, this last-mentioned expensive undertaking, is intimated by the name 'Adelphi,' which is the Greek term for 'brothers;' and by the application of their own name, 'Adam,' to the principal street leading to the terrace, and of their respective Christian names, 'Robert' and 'James,' to two of the minor streets.

The Messrs. Adam were among the first, if they were not themselves the very first, to make use in London of a stucco in imitation of stone, for external architectural decorations; and that which they employed was an oil cement or composition, invented by Liardet, a Swiss clergyman resident in this country, who had obtained a patent for the preparation of it, which patent they purchased. This was infringed by pretended improvers, and the proprietors were thereby involved in a troublesome and expensive suit to protect their own interests, and were, moreover, involved in disputes with rival builders and surveyors. Most of the works produced by the Messrs. Adam in the course of their practice and business, as architects and builders, where stone is not used, are either faced entirely, or their architectural decorations are formed, with this composition, which has endured, now at the end of half a century, far better than was predicted at the time.

The style of architecture introduced by the Messrs. Adam was peculiar to themselves, and very faulty; but there is nevertheless an air of prettiness, and some good taste in it; and the credit may certainly be claimed for its authors of having done much to improve the street architecture of London, for which species of composition their style was better adapted than for detached and insulated structures. Their taste seems to have been slightly affected, and in that slight degree beneficially, by the Greek style of composition which Messrs. Stuart and Revett were then making known, but they certainly were far from entering into the spirit of it; they departed moreover almost entirely from the laws and usages of the Italo-Vitruvian school, which was then called classical, and introduced many deviations alike inconsistent with the styles of Greece and Rome, with the laws of the schools, and with sound sense and good taste. The entire omission, or contraction, of an architrave in their entablatures, the extravagant breadth of their friezes, the shallowness and almost universal meanness of their cornices, and the still meaner and more tasteless style of the decorative ornament with which they beplastered their friezes and ceilings, are among the most glaring faults of their peculiar manner. In their insulated compositions especially, the worst of these faults are aggravated by varieties of them being introduced, not only into different, but also into the same elevations of the same structures, which should at least harmonize even in their defects. Both Kenwood and Luton Houses are examples of this; they both have mean entablatures, which are differently composed and proportioned, on the same and on different fronts of the respective edifices. In mere street-fronts the style of the Messrs. Adam, as we have before intimated, is not only less offensive, but it is at times made even pleasing. The front of the British Coffee-house, in Cockspur Street, though a mere trifle, is by far the best of their fronts with which we are acquainted; and the Admiralty screen has more beauties and fewer defects than most things of the kind they executed; but this last, it must be confessed, is less after their own manner, and more in conformity with the rules of art.

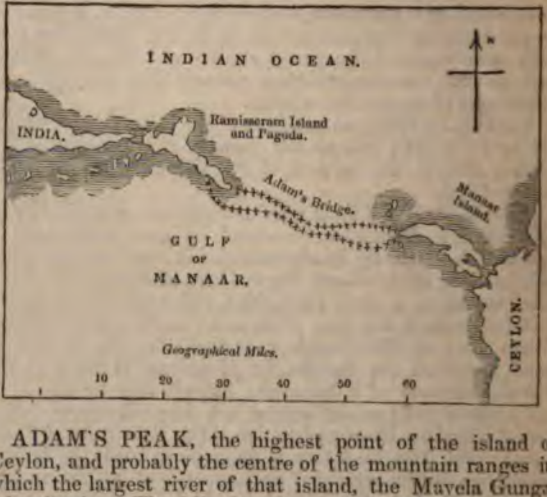
Mr. R. Adam did not retain the appointment of architect to the king more than four or five years, for he resigned it on being returned to parliament for the county of Kinross in 1768. This latter circumstance, however, does not appear to have interrupted his professional avocations, for we find that he continued to be actively engaged in business down to the period of his death, which took place in March, 1792, in the sixty-fourth year of his age, in consequence of internal hemorrhage, occasioned by the rupture of a blood-vessel. He was buried in Westminster Abbey, in the south transept of which is a tablet to his memory.

As an architect Mr. Adam displayed an original and independent mind; for it required, in his day, no small degree both of originality and independence to break through the trammels which had been imposed upon architecture. This Adam did, nevertheless, and though the result was that he became a mannerist, after a very peculiar, and, as we have shown, not very elevated or classical style of his own, the effect on English architecture was, on the whole, good. With Mr. Adam, we believe originated the idea of giving to a number of unimportant private edifices the appearance of one imposing structure, by external architectural arrangements; and he certainly has the credit of having carried this principle extensively into effect in several of the instances we have mentioned.

As a member of society, Mr. Adam enjoys the reputation of a kindly disposition, of great sweetness of manners, and of a high moral character, which assured to him affectionate regard in private life, and confidence and esteem in public.

ADAM, (Sculptors.) There were three brothers of this name, who all enjoyed some reputation as sculptors in France in the early part of the last century. They were the sons of a sculptor named Jacob-Sigisbert Adam, who lived at Nancy. The eldest, Lambert-Sigisbert, was born there on the 10th February, 1700, and made his first appearance at Paris in 1719. After remaining in that city for four years, he gained the first prize in the Academy, and proceeded to Rome on a pension allowed him by the king. Here he spent about ten years, and among other works furnished the design which was adopted by Clement XII., one of sixteen which were presented for the intended fountain of Trevi. The offers of the French government then induced him to return to Paris. On the 25th May, 1737, he was admitted a member of the Academy, and he was afterwards appointed professor in that institution. The two best known of this sculptor's productions are, a group of Neptune and Amphitrite, which he executed for the Basin of Neptune at Versailles, and on which he spent five years; and a figure of St. Jerome, originally intended for the Hospital des Invalides, but now placed in the church of St. Roch, at Paris. They are fair specimens of the French school of that age, which, however, was one of the least brilliant periods in the history of modern art. Adam published, in 1754, a work entitled *Recueil de Sculptures Antiques Grecques et Romaines*. He died of apoplexy on the 13th May, 1759. Nicolas Sebastian, the next brother, was born on the 22d March, 1705. He came to Paris at the age of eighteen, and went to Rome in 1726, where, two years after, he obtained one of the prizes at the Academy of San Luca. Having remained here for nine years, he returned to Paris; and after some time was also, like his elder brother, received into the Academy. Among the designs which he produced was one for the Mausoleum of the Cardinal de Fleury. His two principal works were a tomb for the wife of King Stanislaus of Poland, and his Prometheus chained to a Rock (which has been commonly assigned by mistake to his elder brother). For the latter work he had an offer from the King of Prussia of 30,000 francs; but he declined accepting it, on the ground that the sculpture belonged to his own sovereign, for whom it had been at first intended. He died on the 27th March, 1778. The third brother, François-Gaspard, was born in 1710. He made his way, like his elder brother, to Rome, and also on his return from Italy fixed his residence in Paris. He worked for some years at Berlin, in the service of the King of Prussia, and died at Paris in 1795. [Abridged from the *Biographie Universelle.*]

ADAM'S BRIDGE, a series of sand banks, which, with two small islands, extend from a point in the southern peninsula of India (140 miles north-east of Cape Comorin) to the opposite island of Ceylon. The width of the channel is about sixty geographical miles, and there are only two navigable passages in it. One, called the Manaar passage, which separates the small island of Manaar from the adjacent coast of Ceylon, has not more than four feet water at flood-tide. The other, and more northern passage, is called the Paumbeen, and separates the main land from the island of Ramisseram, celebrated for its great pagoda and extensive remains. The Paumbeen passage is very narrow, and not more than six feet deep at high water. The space between the two nearest points of Manaar and Ramisseram, which is about thirty miles wide, is a bank of sand, only covered at high water. Thus, if a vessel of moderate size has occasion to sail from any one point north of the Bridge into the Gulf of Manaar, it must make the whole circuit of the island of Ceylon. The ninth degree of north latitude passes through the southern part of Manaar Island. [See *Journal Educ.* No. 6.]



ADAM'S PEAK, the highest point of the island of Ceylon, and probably the centre of the mountain ranges in which the largest river of that island, the Mavela Gunga, takes its rise. The following description of it is by Robert Knox, an Englishman, who was near twenty years a prisoner in the island. (London, 1681.)

'On the south side of Conde Uda is a hill, supposed to be the highest on this island, called, in the Chingulay language, Hamalell; but, by the Portuguese and the European natives, Adam's Peak. It is sharp like a sugar-loaf, and on the top a flat stone with the print of a foot like a man's on it, but far bigger, being about two feet long. The people of this land count it meritorious to go and worship this impression; and generally about their new year, which is in March, they, men, women, and children, go up this vast and high mountain to worship.—Out of this mountain arise many fine rivers, which run through the land, some to the westward, some to the southward, and the main river, viz. Mavelagonga, to the northward.'

The print of the foot is supposed to be that of Buddha, which he left when ascending to heaven. He has no temple on this mountain, according to Knox, but 'unto this footstep they give worship, light up lamps, and offer sacrifices, laying them upon it, as upon an altar.' Besides the footstep on the mountain-top, there was, in Knox's time, a tree in the north part of the island at Annarodgburro, which was annually resorted to at the same time with the footstep, and was held in equal honour, as it was said to have come flying over from the mainland, and to have planted itself. When Buddha was on the earth, he used often to sit under this tree.

The Greek geographer Ptolemy, who had some knowledge of Ceylon, gives to Adam's Peak the name of Male, which is evidently the same word as the Hamalell of Robert Knox.

Adam's Peak is in about 6° 50′ N. L., 80° 35′ E. L., and 45 miles E. S. E. of Columbo, which is on the west coast. The elevation of the mountain is about 7000 feet. The principal materials of which it is composed are gneiss and granite. Thick forests clothe the lower part of the mountain, which is, as Knox describes it, very steep and difficult of access. The path which leads to the summit is the work of the devotees who go to pay their respects to the sacred footstep.

A'DAMANT, a word no longer employed as a scientific term, but used chiefly as a poetical expression synonymous with diamond, or as descriptive of some other hard precious substance, or merely to convey an idea of extreme hardness. Milton, Pope, and Gray, make use of it in these different senses, as well as the adjective *adamantine*. The real and primary meaning of the word adamant, which is derived from the Greek, is *unbroken*, or *what cannot be broken*.

ADAMAN'TINE SPAR, a simple mineral, more commonly denominated CORUNDUM by mineralogists, the name given to it in India, from which country it was first brought to Europe. The first specimens of it were sent by Dr. Anderson, of Madras, to Mr. Berry, a lapidary in Edinburgh, as the substance used in India to polish masses of stone, crystal and all other gems, except the diamond. It was examined by the celebrated Dr. Black, who ascertained its peculiar nature, and from its great hardness, he called it adamantine spar. With the exception of the diamond, it is the hardest substance known. It contains about 90 per cent. of alumine, a little iron, and a little silica, is usually of a pale grey or greenish colour, but is also found of various tints of red and brown. It is usually met with in rough ill-defined crystals, in granite, and sometimes in primary limestone, and is found in China, many parts of India, and occasionally in different parts of Europe. EMERY, the well known substance used in the cutting and polishing of glass, in polishing steel, making razor-straps, and similar purposes in the arts, is a granular variety of corundum, usually very much mixed with iron ore. It is chiefly imported from the Isle of Naxos, in the Grecian Archipelago, but is also found in Saxony. The SAPPHIRE is a remarkable instance how the mysterious chemistry of nature in the mineral kingdom produces from the same elements substances the most different in external form; this beautiful precious stone yielded by the analysis of Chenevix 94 per cent. of alumine; and Tennant found in emery, when freed from its admixture of iron, 92 per cent. of the same earth. The sapphire is, after the diamond, the most valuable of gems; it is usually dark blue, but also occasionally colourless, and the precious stones called by lapidaries *oriental* ruby, *oriental* topaz, *oriental* amethyst, and *oriental* emerald, are red, yellow, violet, and green *sapphires*, distinguishable from the other gems of the same name which have not the prefix *oriental*, by their greatly superior hardness and greater specific gravity. Sapphires are found in gravel and sand in the island of Ceylon and in Pegu, but they have never been seen in a matrix. They are also occasionally found in gravel in different parts of Europe, and they have been met with of a clear blue colour and crystallized, in the lava of Nieder Mendig, near Andernach on the Rhine.

ADAMS, JOHN, a distinguished American statesman. He was born in the town of Braintree, near Boston, in Massachusetts, on the 19th October, 1735, of a family which had come from England at the first settlement of the colony. At the usual age he was sent to Harvard College, in the neighbouring town of Cambridge; after leaving which, he proceeded to study the law, and was in due time called to the bar. He soon raised himself, in the profession which he had thus chosen, to great reputation, and extensive practice. In 1765 he published anonymously, in the Boston Gazette, a series of papers under the title of an Essay on Canon and Feudal Law, intended to expose the absurd and oppressive character of these systems, which attracted considerable notice, and were, in 1768, collected and reprinted in London. In 1765, when the first opposition of the people of America was excited by the Stamp Act, Mr. Adams took an active part in those measures of constitutional opposition which eventually forced the repeal of that obnoxious statute. An offer of the lucrative office of Advocate-General in the Court of Admiralty, made to him the following year by the Crown, with the view of detaching him from the popular cause, was instantly rejected. He was one of the *select* men, or state-representatives, deputed by the several towns of the province, who in 1770 met in convention at Boston, on the announcement of the intention of the British Government to station a military force in that town, in order to controul the populace, exasperated by the new act imposing duties on glass, paper, tea, &c., which had been passed in 1767, and by the other measures which indicated a determination in the mother country to maintain at least the principle of her late aggression. Soon after this, however, Mr. Adams gave a proof both of his intrepidity, and of the moderation which was associated with his zeal, by undertaking the defence of Captain Preston and his men, who, on the 5th of March, 1770, had killed several of the people of Boston in a riot—a transaction which used to pass under the name of the Boston massacre. He delivered a very powerful speech on this occasion, when the jury acquitted all the prisoners of murder, and only found two of them guilty of manslaughter. To the honour of his countrymen, the part he had thus taken did not diminish his popularity or influence; and he continued, during the remaining first years of the struggle, to exert himself conspicuously in the front rank of the friends and supporters of the colonial cause. In 1773, and again in 1774, he was returned by the House of Assembly a Member of the Council of the State; but on both occasions the governor, General Gage, put his negative on the nomination. The latter year, however, he was elected one of the four representatives from the province of Massachusetts Bay, to the General Congress, which met at Philadelphia on the 26th of October, and which, among other proceedings, entered into a resolution to suspend the importation of British goods; and he was also a member of the second assembly of the same nature, held some time after, which took measures to enrol the people in an armed national militia. In 1775 he was offered the appointment of Chief Justice of his State; but this he declined, feeling that he could better serve his country in another sphere. It had already become evident to many, indeed, that the contest with Great Britain must finally be decided by the sword; and Adams seems to have been one of the first who adopted this conviction. He was accordingly one of the chief promoters of the Declaration of Independence, passed on the memorable 4th of July, 1776. The motion was made by Mr. Lee of Virginia, and seconded by Mr. Adams; who, along with Mr. Jefferson, was appointed the sub-committee to prepare the declaration. It was actually drawn up by Mr. Jefferson. In November, 1777, Mr. Adams proceeded to Paris, as a Commissioner from the United States to that court; and after remaining for a short time in France, returned to America, when he was elected a Member of the Convention for preparing a new constitution for Massachusetts. In 1780 he was sent by the United States as their ambassador to Holland; from which country, about the end of 1782, he proceeded to France, to co-operate with Dr. Franklin and his brother commissioners in the negotiations for peace with the mother country. In 1785 he was appointed the first ambassador from the United States to Great Britain; and he had his first audience with his Majesty in that character on the 2d of June. He remained in England till October, 1787. In 1789, when Washington was elected President of the Union, Mr. Adams was elected Vice-President, and he was re-elected to the same office in 1793. In 1797, on the retirement of Washington, he was chosen President; but he failed to be re-elected on the expiration of his first term of four years, his competitor, Mr. Jefferson, who had also been opposed to him on the former occasion, having a majority of one vote. The general tone of the policy of Adams had been opposed to that of the democratic party, which was represented by Jefferson; but he does not appear to have given complete satisfaction to the other great party whose leading principles he espoused. On failing in being re-elected president, he retired from public affairs to the quiet of his country residence at Quincy; declining, although nominated, to stand candidate at the next annual election for the governorship of Massachusetts. The rest of his life he spent in retirement. For some years before his death his health had become extremely feeble, and at last little more remained of the once active and eloquent statesman than the mere breath of life. In this state he was when the morning arrived of the 4th of July, 1826, the fiftieth anniversary of the Declaration of Independence. Awakened from sleep by the ringing of bells and other rejoicings of that grand jubilee, the venerable patriot was asked if he knew the meaning of what he heard. 'Oh, yes,' he replied, the glow of old times seeming to return to him for a moment, 'It is the glorious 4th of July!—God bless it—God bless you all!' Some time after he said,—'It is a great and glorious day,'—adding, after a pause apparently of deep thought, 'Jefferson yet survives.' These were the last words he was heard to utter. About noon he became alarmingly ill, and at six in the evening he expired. The same day also terminated the career of Jefferson, his fellow-labourer in laying the foundations of the independence of their common country, and afterwards his successful rival. Except for a short time, however, these two distinguished men were friends throughout life. Besides the early publication that has been mentioned, and many fugitive pieces, Mr. Adams was also the author of a work first printed in 3 vols. 8vo., in 1787, while he was in this country, under the title of 'A Defence of the Constitution and Government of the United States,' but afterwards remodelled and reprinted in 1794, with the new title of a 'History of the Principal Republics of the World.' It is designed to serve, by an ample induction from history, as a vindication of the federal principles of the American Constitution, an attachment to which, indeed, has always been considered the distinctive characteristic of this statesman and his party. His son, John Quincy Adams, is still alive, having spent a large part of his life in the service of the United States, and like his father, having attained the honour of being *once* elected to fill the office of chief magistrate of the republic. [See *Encyclopædia Americana.*]

ADAMS, SAMUEL, a conspicuous actor in the American Revolution. He was born at Boston on the 27th of September, 1722, and received his education at Harvard College. After passing through the usual course of instruction at that college, he applied himself to the study of divinity, with the intention of becoming a preacher in the Calvinistic communion, to which his family belonged. Although he abandoned these professional views, probably his early theological studies had considerable influence in forming the character of the man; and he at any rate retained to the end of his life a stern and somewhat intolerant attachment to the religious principles in which he had been educated. He was better fitted, however, for the rude contests of politics than the peaceful ministrations of a Christian clergyman. Accordingly, on the first outbreaking in his native province of the irritation and disturbances occasioned by the Stamp Act in 1765, Adams threw himself with zeal and determination on the popular side. From that moment the forwarding and maintaining of the cause of his country's independence became the business of his life. The same year in which the Stamp Act was passed, he was deputed by his fellow-citizens as one of their representatives in the legislature, of which assembly he was immediately after elected clerk. In 1774 he had the honour of being sent as one of the four members from Massachusetts to the first Congress. His name appears subscribed to the Declaration of Independence in 1776. After the conclusion of the war he was nominated a member of the convention for settling the constitution of Massachusetts; and he afterwards occupied a seat in the senate of that state, and presided over it for some years. In 1789 he was elected to the office of lieutenant-governor, and in 1794 to that of governor, to which he was re-elected annually till 1797, when he retired from public life. He died at Boston on the 2d of October, 1803. Samuel Adams was one of the firmest and most active patriots of the Revolution, and powerfully contributed to the happy termination of the great cause to which he devoted his life. But he was not a politician of very enlarged views; and useful as he proved in the subordinate sphere in which he acted, there can be little doubt, from many parts of his conduct, that the national struggle would hardly have been brought to the successful issue with which it was eventually crowned, if it had not been guided by wiser heads than his. He was actuated in the whole course of his political career almost exclusively by one idea or feeling—jealousy of delegated power, however guarded. 'Samuel Adams,' said one of his friends and admirers, 'would have the State of Massachusetts govern the Union, the town of Boston govern Massachusetts, and that he should govern the town of Boston, and then the whole would not be intentionally ill-governed.'—[Abridged from the *Encyclopædia Americana.*]

ADANSON, MICHAEL, a French naturalist of high reputation, was born at Aix in Provence, April 7, 1727. He was of Scotch extraction, but his family had become exiles in consequence of the troubles that distracted Scotland in the early part of the 18th century. At a very early age he was placed at the University of Paris, under the care of the celebrated Réaumur and of Bernard de Jussieu; and it is supposed that from these preceptors he imbibed that love of the study of Natural History, by which he afterwards became distinguished in so eminent a degree. His success in carrying off the academical prizes from his competitors soon attracted attention, and Needham, the well-known microscopic observer, having upon one occasion been witness to his triumph, presented him with a microscope, accompanied, it is said, by these prophetic words, 'Young man, you have studied books enough; your future path will be among the works of nature, not of man.' At this time great originality of thought and a strong bias for systematic arrangement had already begun to develope itself. Emulous of the reputation of Linnæus, which had already found its way among the French, young Adanson is said, when only fourteen, to have sketched out not less than four methods of classifying plants. His friends had destined him for the church, but a feeling that his pursuits, and perhaps his temper, were but ill-adapted to the duties of the priesthood, induced him to resolve upon seeking some other employment, in case his slender patrimony should prove insufficient for his wants.

The genius of Adanson was much too active to allow him to remain in the walks of quiet life. An opportunity occurring of visiting the country whence ivory, and gums and frankincense were procured, he eagerly embraced the occasion, although at the expense of a considerable portion of his fortune. At that time the natural history of Africa was almost unknown, except from such of its commercial products as were brought to Europe. In 1748 he embarked for Senegal, being then twenty-one. Five years were spent by him in this colony, during which time he succeeded in forming considerable collections in every branch of natural history. Not only were botany and zoology the objects of his attention, but he amassed a large store of meteorological observations; he made himself acquainted with the language of the native tribes, and carefully preserved their respective vocabularies; he traced the river Senegal to a considerable distance in the interior, formed charts of the country, and finally returned to Paris in 1753, rich in knowledge, but impoverished in worldly means. His *Natural History of Senegal*, published at Paris four years afterwards, is a mass of original views, and of valuable practical information. Among other things, it contained the first attempt upon record of classifying shells according to the animals they contain, instead of their external forms alone. The opinions that Adanson had early held of the insufficiency of the classifications in natural history at that time received in Europe, had become confirmed by his discoveries in Africa. He saw that however easy and complete the systems of Linnæus and Tournefort might seem to those acquainted with the European Flora only, they were both essentially defective when applied to vegetation in a more extended manner. He perceived that the sexual system of Linnæus was founded upon incomplete and partial views. To the method of Tournefort the objections appeared fewer, and accordingly he determined to attempt a classification of his own, of which that of Tournefort might serve as the basis. This appeared in 1763, in two volumes 8vo., under the name of *Families of Plants*. In this work Adanson particularly insisted upon the indispensable necessity of a system being so far in accordance with nature, that all those objects which most resemble each other may be classed together;

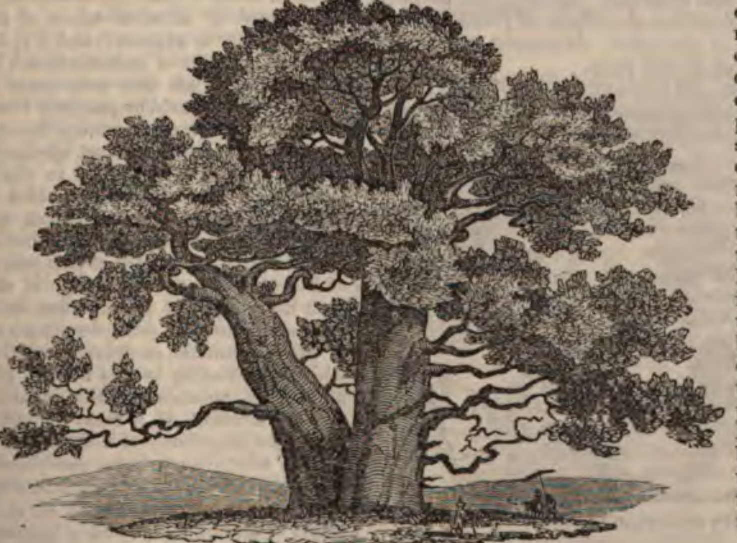
he demonstrated that, to effect this, it is absolutely necessary for a system to be founded upon a consideration of all the parts of the objects which it comprehends, and that it cannot be confined to differences in the nature of a few organs only; the artificial system of Linnæus he for that reason most justly considered inferior to the method of Tournefort. In many respects this work of Adanson's deserves the eulogium passed upon it by one of his historians, who pronounces it a production not more brilliant than profound; it is a collection of a great number of just views of the analogies that exist among plants; it no doubt furnished many important suggestions to Jussieu in the construction of his system; and it is to this day consulted by those who make the philosophy of botany their study. Unfortunately for its author, and still more for science, his views were more advanced than those of his contemporaries; his perceptions of botanical truths, however just, were of a nature not to be valued by those who had less experience or acuteness than himself; he also attempted to introduce a barbarous nomenclature, which, it must be confessed, was at variance with common sense; and what was worse than all, he had unceremoniously rejected that system of Linnæus which had become the basis of the botanical creed of almost all Europe. For these reasons, notwithstanding the high character of Adanson's *Families of Plants*, they have scarcely had any circulation beyond France; and when, in 1789, the *Genera Plantarum* of Jussieu made their appearance, the utility of his work generally ceased.

From this period we have little to record concerning the scientific career of Adanson. A few miscellaneous papers, a chimerical project of a vast Encyclopædia of Natural History to contain 40,000 figures, and a portion of the early part of the botanical division of the Supplement to the French Encyclopædia, are all that he has executed. Up to the period of the French revolution, he appears to have been chiefly occupied in amassing collections for the stupendous work he had in contemplation, and in making experiments upon vegetable physiology. That political catastrophe overwhelmed him in the ruin it brought for a time upon his country; the little that remained of his fortune was annihilated; he had the mortification to see his plantations of mulberry-trees, which had been long the object of his simple care, destroyed by a ferocious rabble; and he fell into so lamentable a state of destitution, that when upon the establishment of the Institute of France some years after, he was invited to become one of the earliest members, he was obliged to refuse the invitation to attend 'because he had no shoes.' In his latter days he enjoyed a small pension from the French government; but his constitution was broken by the calamities he had undergone; a complication of maladies tormented him, a softening of the bones confined him to his bed, and on the 6th August, 1806, he was finally released from his afflictions by the hand of death, in the eightieth year of his age.

While the scientific character of Adanson has been, perhaps, too highly estimated by his own countrymen, it has been most unfairly depreciated by others. That he was a man of a very comprehensive mind, of considerable learning, much experience, great acuteness, and perfect independence of thought, is evident from his writings. This would be clear from his miscellaneous memoirs, if we had not his greater works to judge by. He is, however, a very instructive instance of the folly of eccentricity, and of the evils to which a disregard of established ideas in unimportant matters is sure to lead; his example shows that the value of the most useful discoveries may be altogether destroyed by a capricious affectation of unmeaning singularity. Had he been less absurd in his nomenclature, his popularity would have certainly anticipated that of Jussieu, and might have struck some twenty or thirty years off the reign of the Linnæan school. It would have been impossible for the great Swedish autocrat in science to have resisted the attacks of so active and vigorous an assailant, who had knowledge and truth on his side. Adanson has been charged with being led by pique and wounded pride, to the opinions he held regarding Linnæus and his system; this has been inferred from a few complimentary expressions in a letter dated not more than a year anterior to his first attack upon the Linnean system—expressions which have been thought to prove that the public declarations of Adanson were at variance with his private sentiments: it is, however, far more probable, as it surely is more charitable, to suppose that he was really led by that love of truth and honesty of purpose, which we have ample evidence to prove that he possessed. As a philanthropist, his name will always be respected by every friend of civil liberty; for he was among the first to plead the cause of the slaves, and to insist upon the impolicy, as well as injustice, of forced labour. In 1753, a plan, very like that upon which the new American colony of Liberia has been established, was presented by him to the French government, for the whole of the French provinces in Africa. The ministers of such a sovereign as Louis XV. were not the men to listen favourably to a project of this nature, and it fell to the ground. Such was his love of his country, that although his circumstances do not seem ever to have been very good, he had firmness enough to resist offers from the Emperor of Austria, Catharine of Russia, and the king of Spain, to enter into their service. Under the cruel misfortunes that attended his latter days, he is represented to have exhibited great patriotism and magnanimity; which was the more to be commended, because he was naturally of an impetuous and irascible temper. [See *Bibl. Univ.*, vol. i. *Spreng. Hist. R. herb.* v. ii., *art.* Adanson, *in Rees' Cycl. Suppl.*]

ADANSONIA, so called in honour of Michael Adanson, a French naturalist, the subject of the preceding article, is an extraordinary tree found in Africa within the tropics, particularly in Senegal, where it is called *Baobab*.

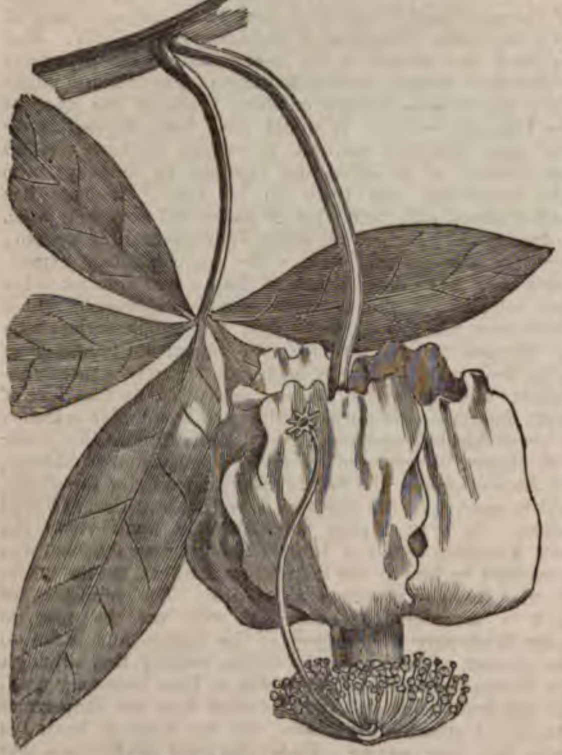
The celebrated traveller Humboldt considers it as the 'oldest organic monument of our planet,' in consequence of the calculations of Adanson that specimens, still found on the north-west coast of Africa, are probably 5000 years old; these calculations are, however, open to many objections. [See Age of Trees.] In appearance, *Adansonia* is unlike any other known tree: the enormous dimensions of its trunk bear a striking disproportion to the other parts; it is not unusual to find a trunk not more than twelve or fifteen feet from the root to the branches, with a circumference of seventy-five or seventy-eight feet. The lower branches are very long, and at first horizontal, extending, perhaps, sixty feet; the consequence of which is that they bend down to the ground, entirely hiding the trunk, and giving the tree the appearance of a huge mass of verdure. The wood is very soft, even when in perfection, and is subject to a disease which may be compared to the very malady of which its celebrated discoverer died,—a sort of softening of all the hard parts, so that the least storm is sufficient to overthrow and dismember its enormous bulk. A curious practice prevails among the negroes of hollowing its trunk out into chambers, and therein depositing the bodies of malefactors, or of persons to whom the usual rites of sepulture are denied. In this situation the bodies become dried up, and soon acquire the state of perfect mummies.



[Adansonia digitata.]

Adansonia belongs to the natural order *Bombaceæ*, among which it is at once known by a broad tube of stamens and deciduous calyx, combined with a woody closed-fruit, containing a soft pulp.

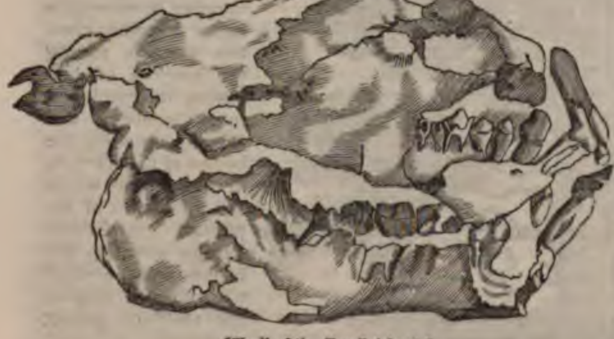
The only species is *Adansonia digitata*, the monkey-bread, sour gourd, lalo plant, &c., of the African negroes.



[Leaf and flower of Adansonia digitata.]

The leaves are deep green, and divided into five unequal parts, each of which is of a narrow, lanceolate figure, and radiates from a common centre. the outermost divisions being the smallest. The flowers grow singly in a pendulous position from the bosom of the leaves, are very large, white, crumpled at the edge, and have the petals very much reflexed. The stamens are very numerous, and are collected into a tube, which spreads at the top into a sort of umbrella-like head, from the midst of which arises a slender curved style, terminated by a rayed stigma. The fruit is an oblong, dull green, downy body, eight or nine inches long, containing several cells, in each of which there is a number of hard, shining seeds immersed in a soft pulp, which is scarcely juicy. From this pulp the negroes prepare an acidulous drink, much used in the fevers of the country. The bruised leaves, in a dry state, form a substance called *lalo*, which they mix with their food and imagine is useful in checking, or counteracting, the effects of profuse perspiration. Like the rest of the order, *Adansonia* is emollient and mucilaginous in all its soft parts.

ADAPIS, in zoology, the name of a genus of fossil pachydermatous (thick-skinned) mammals, described by M. Cuvier, in his great work *Sur les Ossemens Fossiles*, vol. iii. p. 265. The word is found in Gesner, as a synonyme of the common rabbit (not, as stated in the reference just given, of the *hyrax*), and is appropriated to the present genus, from the presumed similarity in size, organization, and habits, which probably existed between the latter animal and the fossil species.



[Skull of the Fossil Adapis.]

The remains, upon which M. Cuvier has founded the genus Adapis, the only specimen which he was able to procure during a period of twenty-five years devoted to researches after fossil bones, consist of three fragments of skulls, found in the plaster quarries of Montmartre, celebrated for the enormous quantity and variety of the remains of extinct animals which they have produced; and which, in the hands of M. Cuvier, nave effected such improvements in the kindred sciences of zoology and geology. The first of these fragments is a head, nearly perfect on the side imbedded in the mass of gypsum which contained it; and exhibiting the dentition nearly in a perfect form. The general outline of this skull closely resembled that of the hedgehog, but it was about one-third larger: there were four incisor teeth in each jaw, trenchant or edged and oblique; followed, on each side, by a canine tooth, of a conical form, but in other respects differing little from the molar teeth in length and figure. Of these latter, there appear to have been seven in each side of each jaw. The first of the upper jaw was trenchant; the second and third surrounded by a small ridge; and the remaining four flat crowned, as in ordinary herbivorous animals. In the under jaw the three first molars are pointed and trenchant, and the other four tuberculous, and similar to those which opposed them in the upper. Two other fragments procured by M. Cuvier,—one a portion of a lower, another of an upper jaw,—served to complete this description, by supplying some of the back teeth which were wanting in the more perfect specimen.

The few facts here reported, the only details which we at present possess concerning this extinct genus, are still sufficient to enable us to determine some of its most important affinities, and to assign its probable location in the system of natural beings. In fact, we only require to know the form of its feet and claws, to possess all the data necessary to determine its general conformation, as well as its habits and economy. The facts, already known, show us that this inhabitant of a former world must have belonged to that tribe of animals which M. Cuvier denominates pachydermata, from the great thickness of their skins, and which includes all hoofed quadrupeds that do not ruminate or chew the cud. Among recent, or existing animals, there are scarcely two dozen species appertaining to this group; and only eight different genera, all widely separated from one another, and without any of those intermediate forms and modifications, which, in other natural orders, unite the different genera by an almost imperceptible gradation of characters. The horse, the elephant, the rhinoceros, the hippopotamus, the tapir, the hog, all pachydermatous quadrupeds, have few characters in common; are allied to one another by no intermediate forms among the existing race of animals; and, in fact, appear to be rather the types of so many distinct and separate families, than the genera of one common order. This circumstance, so different from what is presented by all other tribes of animals, it was reserved for M. Cuvier to explain; and it is not a little singular that the fossil remains of animals which have long since ceased to exist, but which this truly great man has restored and characterised, should be precisely those which are wanting to complete the connexion among the existing genera of pachydermata. Of eighty extinct species of mammals discovered by M. Cuvier, and described in the *Ossemens Fossiles*, no fewer than fifty appertain to this order; thirty-eight of which belong to eleven distinct genera, which have no representatives among living animals. These serve to connect the existing genera of pachydermata with one another, and to complete that gradation of characters, which, before their discovery, was so imperfect in this order of animals. This abundance of pachydermata among the fossil remains of extinct animals, compared with the very small proportion which the existing species of this genus bear to the total number of animals actually inhabiting the globe, at the present moment, is a most remarkable and curious fact; whilst the singularity of their forms, and the number of new genera which have been established upon their different modifications, are extremely interesting; more particularly when we are told that, among all the fossil remains of other orders of mammals, no single fragment has been discovered to indicate the former existence of a genus different from those which subsist at the present moment.

ADAR, the twelfth month of the Hebrew year, as appears from Esther iii. 7: 'The twelfth month, that is the month Adar.' The name of this month is Chaldee, and does not occur in the earlier books of the Bible, where the months are usually designated by their numerical order.

In the Jewish Calendar, Adar is the sixth month. In ecclesiastical computations, it is still the last of the year. A year composed of twelve lunar months is shorter by about eleven days than a true year, and, if unaltered in length, would be perpetually changing the season of its commencement. To avoid this inconvenience, all nations using such a year (except the Mohammedans) occasionally insert an additional month, to bring the beginning of the year to the same season. The additional month in the Jewish Calendar immediately follows Adar, and is called Ve-adar. This intercalation occurs seven times in nineteen years.

Adar may begin as early as the 1st of February, or as late as the 3d of March: in 1833, it begins on the 20th of February. In years of twelve months there are twenty-nine days in Adar; in those of thirteen months, there are thirty days in the month.

A fast is observed by some Jews in memory of the death of Moses on the 7th day of the month; another on the 9th, for the schism in the schools of Shammai and Hillel. On the 13th day of the month, the fast of Esther is kept by the whole Jewish nation. This fast is said to have been instituted in memory of the intended destruction of the Jews in the Persian empire on that day (Esther, iii. 13). If the 13th day should be a Saturday, the fast of Esther is celebrated on the preceding Thursday; all other fasts (except the Great Fast of Expiation, which is never postponed) are, in similar cases, held on the Sunday following.

The Feast of Purim, which lasts two days, belongs to the 14th and 15th of the month, in memory of the defeat of the plans laid for destroying the Jews. This feast was celebrated in the mode and on the days appointed in the 9th chapter of Esther, verses 15—21. It is made 'a day of gladness and feasting, and a good day, and of sending portions one to another.' Two days were dedicated to this festival, because the slaughter of the enemies of the Hebrews ceased on those two days in the different provinces of the empire.

In the years in which the month Ve-adar is inserted, the Purim and the Fast of Esther belong to that month; and the 14th of Adar is called the First or Little Purim. It appears, then, that in the intercalary year, it is the first Adar that is really the intercalary month, as the festivals remain to Ve-adar. [See Ideler, *Lehrbuch der Chronologie, Berlin*, 1831.]

The festival in honour of the dedication of the second Temple, is kept by some Jews on the 16th, and by others on the 23d of this month. There is no exact account of the day of dedication; the Temple was completed on the 3d day of the month. Ezra vi. 15.

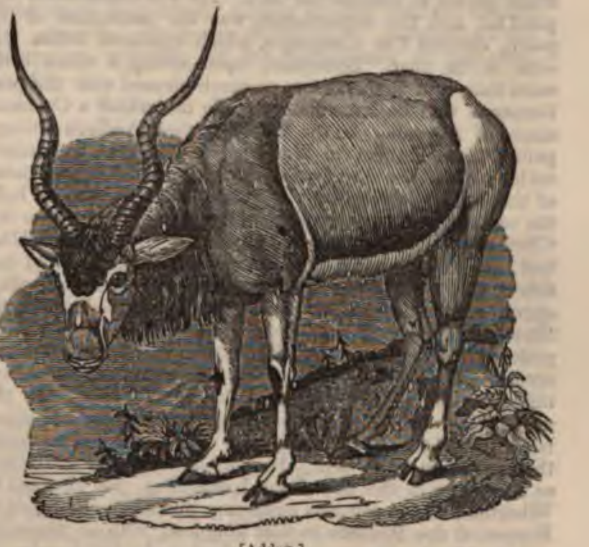
Adar is the name of the seventh month of the Syro-Macedonian year, which coincides nearly with our March.

ADDA, or **El Adda**, the Arabic name of a small species of lizard, celebrated by the eastern physicians on account of its pretended efficacy in the cure of elephantiasis, leprosy, and other cutaneous diseases, to which the Arabs and inhabitants of Egypt are peculiarly subject; and of which, according to Bruce, they are more afraid than of the plague itself. We are not informed of the manner in which these wonderful cures are effected; whether the living animal is applied externally, as toads have been to cancers, even in our own country, or taken inwardly in the form of a powder; but, in all probability, its reputed virtues, in either case, have no better foundation than those formerly attributed to the bezoars, rhinoceros-horns, and other animal substances, which composed such an important part of the pharmacopœia of the Arabian school of medicine.

The adda, as described by Bruce, is about six inches and a half in length; the body and tail are cylindrical, the latter thick at the base, and ending in a very sharp point; the head is conical, and the mouth provided with two rows of small feeble teeth; the face is covered with five black lines, which cross one another like a net: the body is a light straw colour, crossed with eight equi-distant bands of black, and the scales are so finely polished, that they almost appear as if they had been varnished. The adda is found in Arabia, Egypt, and Nubia; it is particularly abundant in the neighbourhood of the ancient Meroë (near the Nile about N. Lat. 17°); and, in short, throughout every part of the sandy deserts of Asia and Africa, wherever the slightest traces of moisture exist. 'It burrows,' says Bruce, 'in the sand, and performs the operation so quickly, that it is out of sight in an instant, and appears rather to have found a hole than to have made one: yet it often comes out during the heat of the day to bask itself in the sun; and, if not very much frightened, will take refuge behind stones, or in the withered, ragged roots of the absinthium, dried in the sun to nearly its own colour.'

ADDA, the Roman Addua, a river of Lombardy, which has its source in the Rhætian Alps above the town of Bormio; it waters the Valteline in its whole length, then enters the lake of Como, out of the south-eastern branch of which it issues again below the town of Lecco; it then crosses the plain of Lombardy, passing by Cassano, Lodi, and Pizzighettone, and falls into the Po about eight miles above the city of Cremona. It was by forcing the bridge of Lodi over this river, that Bonaparte won a decisive victory over the Austrians, 10th May, 1796. Again, on the 27th April, 1799, the French, under Moreau, were totally defeated at Cassano, on the banks of the Adda, by the Austrian and Russian armies. Before the fall of Venice, the Adda formed the boundary between the territory of that republic and the Duchy of Milan. It is a rapid and wide stream, affording a good military position, in advance of Milan on the east.

ADDAX, in zoology, a species of ruminating animal, called by the ancients Strepsiceros, from the spiral or twisted form of its horns. It was unknown to modern naturalists till the recent journey of the German traveller Rüppel, who discovered it on the barren sands of Nubia and Kordofan, where it still retains its ancient Arabic name of Addas or Abou-Addas. For a more particular account of this interesting animal, see Antelope.



[Addax.]

ADDER, a name of the common viper. See Viper.

ADDISON, JOSEPH. This eminent writer was the son of the Reverend Lancelot Addison, a clergyman of considerable learning, who eventually obtained the deanery of Litchfield, but was, at the time of the birth of his son, rector of the parish of Milston, near Amesbury, in Wiltshire. Here Addison was born on the 1st of May, 1672. After having been put first to a school in Amesbury, taught by the Rev. Mr. Nash, and then to that of the Rev. Mr. Taylor, at Salisbury, he was sent to the Charter-House, at which seminary he first became acquainted with his afterwards celebrated friend, Steele. From this school he went about the age of fifteen to Queen's College, Oxford, and removed to Magdalen College, upon obtaining a scholarship two years afterwards. He is said already to have obtained considerable facility in the writing of Latin verse; and this talent, which he continued to cultivate and exercise, first brought him into reputation at the university. Several of his Latin poems, most of which were probably produced before he had attained his twenty-sixth year, were afterwards published in the second volume of the collection entitled, *Musarum Anglicanarum Analecta.* The first composition which he gave to the world in his native language was a copy of verses addressed, in 1694, to Dryden, which procured him the acquaintance and patronage of that distinguished poet. He soon after published a translation in verse of part of Virgil's Fourth *Georgic;* and he had also the honour of writing the critical discourse on the *Georgics*, prefixed by Dryden to his translation, which appeared in 1697. But before this, Addison had made himself known to one of the most enlightened and influential patrons of literature in that day, the Lord Keeper Somers, by a poem which he addressed to him, on one of the campaigns of King William. He was also introduced by Congreve to the Chancellor of the Exchequer, Mr. Montague, afterwards Lord Halifax. The advantageous connexions which he had thus formed seem, together with other considerations, to have induced him to abandon his original intention of going into the church. In 1699 Lord Somers procured him a pension of 300*l.* a-year from the crown; and he then set out on a tour to Italy. Here he remained till the death of King William, in the spring of 1702, deprived him of his pension, and also put an end to his expectation of being appointed to a place near the person of Prince Eugene, then commanding the Imperial troops in Italy. Meanwhile he had addressed from that country his well known poetical *Letter* to Lord Halifax, which was greatly admired both in England and Italy, and was translated into Italian by the Abbate Salvini, Greek professor at Florence. Soon after his return home he also published his *Travels*, which he dedicated to Lord Somers. His friends being out of power, he now remained for some time without employment. But at length the victory of Blenheim, in August 1704, excited a wish in the ministers to find some poet who might adequately celebrate its glories; and the Treasurer Godolphin having mentioned the matter to Lord Halifax, the latter recommended his friend Addison as the fittest person to execute the task. He was immediately applied to; and the consequence was the production of his poem, entitled *The Campaign*, which appeared before the close of the year. Godolphin, upon seeing it when little more than half finished, was so much pleased with the performance that he immediately made the author a Commissioner of Appeals. In the following year Addison accompanied Lord Halifax to Hanover; and in 1706 he became under secretary to Sir Charles Hodges, on the appointment of the latter as Secretary of State. He continued to hold the same place under the Earl of Sunderland, by whom Sir Charles was in a few months succeeded. But although he had thus fairly entered upon a political career, he did not desert literature. His next production was his English opera, entitled *Rosamond;* and he also assisted his friend Steele in his play of the *Tender Husband*, not only with a prologue to the piece, but with several of its most effective scenes. In 1707 an able anonymous pamphlet appeared, under the title of *The present State of the War, and the necessity of an Augmentation considered*, which has since been printed among Mr. Addison's works, and was no doubt the production of his pen. In 1709 he went over to Ireland as Secretary to the new Lord Lieutenant, the Marquis of Wharton; the queen also bestowing upon him the office of Keeper of the Records in that kingdom, with an increased salary of 300*l.* He was in Ireland when the first number of the *Tatler* appeared on the 12th of April (o.s.) in that year—the happy idea of Steele, whose connexion with the publication Addison is said to have detected from an observation on Virgil which he had himself communicated to his friend. The active part which he immediately took in the conduct of this periodical work is well known. The change of ministry in 1710, by releasing him from his official duties, and allowing him to return to England, enabled him to make his contributions still more frequent. In the course of this and the following year, he is also understood to have contributed several papers to the political work, *The Whig Examiner*, which was started about this time in opposition to the famous Tory print, *The Examiner*, in which Swift exercised his powerful pen. These papers, which are five in all, are printed among his collected works. The *Tatler* terminated on the 2d of January, 1711; but on the 1st of March following appeared its still more celebrated successor, the *Spectator*, which was continued till the 6th of December, 1712, and of which during the whole of that time Addison was undoubtedly the chief support. The *Spectator* was followed by the *Guardian*, of which the first number was published on the 12th of March, and the 175th and last, on the 1st of October, 1713; and in this also his pen was actively employed. An anonymous pamphlet directed against the commercial policy of the ministry, and bearing the title of *The late Trial and Conviction of Count Tariff*, which appeared this year, is likewise believed to be Addison's, and has been printed among his works. The same year he acquired still greater fame than any of his former productions had brought him by his celebrated tragedy of *Cato*, which was received with extraordinary applause, both on the stage and when it issued from the press. It was played thirty-five nights in succession,—a run of popularity for which it was doubtless in part indebted to its political as well as to its poetical merits; and it was also translated soon after into French, Italian, Latin, and German. On the 18th of June, 1714, appeared the first number of a continuation of the *Spectator*, in which Addison also assisted, till its termination on the 20th of December in the same year. His elegant poetical address to Sir Godfrey Kneller on his picture of the king, also was published about this time. And on the 23d December, 1715, soon after the breaking out of the Rebellion, he commenced a periodical publication in support of the government, under the title of *The Freeholder*, which he continued without assistance at the rate of two papers a-week, till the 29th of June, in the following year. He had now indeed for some time been again engaged in public affairs, having, on the death of Queen Anne, in August 1714, been appointed their secretary by the Lords Justices; and after the coming over of the new king, having again gone to Ireland as secretary to the Lord Lieutenant, the Earl of Sunderland. The earl was soon after recalled, and Addison was then made a Lord of Trade. In 1716 he married the Dowager Countess of Warwick; and in April the following year he was nominated one of his majesty's principal secretaries of state. He soon, however, found it necessary to resign this high employment,—retiring professedly on the ground of ill health, but in reality, as has been generally understood, in consequence of his entire inaptitude both for debate in parliament and for the ordinary business of his office. It is related that his fastidiousness in regard to expression would sometimes so embarrass him in the preparation of an urgent dispatch, that he was obliged to resign the task to one of the clerks, in order that it might be expedited in time. His health, however, had also been for some time impaired by attacks of asthma,—the effects of which were probably in no slight degree aggravated by a habit of over indulgence in wine, to which he had long been addicted, but to which after his marriage he gave himself up more than ever, seeking refuge in its baneful excitement from domestic unhappiness. He left office in March 1718. It was hoped at first that his release from business would have brought about his restoration; and for some time the expected effect seemed to follow. In the course of the year 1719 he was so far recovered as to be able to engage in a somewhat acrimonious controversy with his old friend Steele on the subject of the bill for the limitation of the peerage, then under discussion in parliament, which Steele had attacked in a paper called the *Plebeian*. Addison's defence of the measure appeared in two successive anonymous pamphlets, bearing the title of *The Old Whig*. They are not printed among his collected works; but are undoubtedly his. He again, however, fell ill, and after lingering for some time, at last expired at Holland House, Kensington, on the 17th of June, 1719, when just commencing his forty-eighth year. He left a daughter by the Countess of Warwick.

Soon after Addison's death, his works were collected and published in four volumes quarto, by his friend Mr. Tickell, upon whom he had expressly devolved that duty. Besides the compositions already mentioned, and some translations from Ovid and other poetical pieces, this edition contains a treatise on ancient medals in the form of dialogues, which is understood to have been prepared by the author many years before his death; and a portion of a work which he had commenced in defence of the Christian religion, being that which is commonly known by the name of his *Evidences*. The comedy of the *Drummer*, or the *Haunted House*, which had been published anonymously in his lifetime, with a preface by Sir Richard Steele, was also soon after reprinted by Sir Richard, and declared to be Addison's. Two other performances have likewise been since attributed to him on somewhat insufficient evidence; the first, a dissertation in Latin on the most eminent Roman poets, which appeared, with an English translation, in 4to. in 1718; and the other a tract, entitled a *Discourse on Ancient and Modern Learning*, which was printed with his name in 1739, having been found, it was affirmed, among the manuscripts of Lord Somers. This enumeration comprehends all his published productions. Among the literary schemes which he is said to have formed, but did not live to execute, were a tragedy on the death of Socrates, an English Dictionary on the plan of that of the Italian language by the Academy della Crusca, and a metrical translation or paraphrase of the Psalms. It does not appear that any of these undertakings had been even begun.

Addison, however, has been charged with having been the author of a poetical translation of the first book of the *Iliad*, which was published in 1715 by Mr. Tickell, then his private secretary; and by which it has been said he intended to aim a covert blow at the popularity and success of Pope's *Iliad*, the first volume of which had then just issued from the press. The question of Addison's concern in this affair is of more interest in reference to his moral, than to his literary character. A story has been engrafted upon the circumstance to the effect that Pope, with whom he had been for some years in habits of intimacy and professed friendship, was so stung by what he conceived to be the duplicity and baseness of his conduct on this occasion, that he immediately broke off their intercourse; and never would be again reconciled to him. The celebrated character of Atticus, now inserted in the Epistle to Dr. Arbuthnot, is said to have been composed by Pope after this, and sent by him to his former friend. The clearest examination which this story has received will be found in a long and elaborate note in Dr. Kippis's edition of the *Biographia Britannica*, (vol. i., p. 86, &c.) which is known to have been contributed by Sir William Blackstone. The learned judge has undoubtedly sufficiently refuted many points in the common statement; but still it is certain that a coolness did arise between Addison and Pope not long after the appearance of Tickell's book, and there is also reason to believe that their separation was not unconnected with that somewhat injudicious and ill-timed publication. As for the authorship of the translation, however, it was probably Tickell's own.

The literary greatness of Addison in the estimation of his contemporaries probably stood upon somewhat different grounds from those upon which it is now usually placed. In his own day he was looked upon as a dramatist and a poet of a very high order; and appears to have been not so much admired for anything else as for being the author of *Cato*. That stately but frigid tragedy has long ceased to give the same pleasure, by its sonorous declamation and well-expressed common-places, which it seems to have afforded to our ancestors. The taste which then prevailed in poetry was the most artificial which has distinguished any age of English literature. The quality which chiefly drew admiration was a cold and monotonous polish—the warmth of genuine nature was accounted rudeness and barbarism. The return of the public mind to truer principles of judgment in such matters has been fatal both to the dramatic and to the poetical fame generally of Addison; and although his verses are still read with pleasure as the productions of an elegant and accomplished mind, they are not felt to possess any high degree of that power which we now look for in poetry. His glory is now that of one of our greatest writers in prose. Here, with his delicate sense of propriety, his lively fancy, and above all, his most original and exquisite humour, he was in his proper walk. He is the founder of a new school of popular writing; in which, like most other founders of schools, he is still unsurpassed by any who have attempted to imitate him. His *Tatlers*, *Spectators*, and *Guardians*, gave us the first examples of a style possessing all the best qualities of a vehicle of general amusement and instruction; easy and familiar without coarseness, animated without extravagance, polished without unnatural labour, and from its flexibility adapted to all the varieties of the gay and the serious.

ADDITION, from the Latin *addo* to *give to*, is the putting together of two or more magnitudes into one. In Arithmetic and Algebra it also signifies the most convenient method of doing this, so that the sum or collection of added quantities may be counted or reckoned in the same manner as the parts of which it was composed. The sign of this operation is +, which is generally pronounced *plus*, the Latin for *more*. Thus $a+b$ directs us to add the number denoted by b to that denoted by a, and represents the sum of a and b.

Addition of whole numbers in arithmetic is performed partly by memory, partly by the aid of the decimal system of numeration. [See NUMERATION.] The sum of every two numbers, each of which is not greater than 9, must be remembered; from whence the addition of such numbers as 28 and 9, 33 and 6, &c., can be performed in the head. The further process is the same in principle, whether the several quantities to be added together be tens, hundreds, &c., pence, shillings, &c., or any other denomination. Presuming that no reader will be ignorant of the ordinary methods, we will show the general principle for all cases in the following question, in which any line of headings may be taken:—

Hundreds. Shillings. Roods.	Tens. Pence. Perches.	Units. Farthings. Yards.
b	c	d
f	g	h
l	m	n

Add together d, h, and n, and if they be units, convert the sum into tens and units; if farthings, into pence and farthings, &c., meaning thereby, take the greatest number of tens out of all the units, of pence out of all the farthings, &c., in $n+h+d$, and write what is left under n. *Carry* (as it is called) the tens, pence, &c., to the next column on the left, and add successively m, g, and c to them, taking out the hundreds, shillings, &c., as the case may be, from the result, and writing the remainder only under m. Carry the hundreds, &c., to the next line on the left, and so on.

The addition of fractions is, in principle, as follows. We cannot immediately express the sum of one-half of a foot and one-third of a foot otherwise than by writing $\frac{1}{2}+\frac{1}{3}$ of a foot. But if we recollect that *one-half* is *three-sixths*, and one-third is *two-sixths*, it is evident that the sum of one-half and one-third is *five-sixths*. The rule, therefore, is:—reduce the various fractions to others of equal value, and having the same denominator (see DENOMINATOR), add the numerators, retaining the denominator: or, multiply every numerator by every denominator, except its own; add the results, which gives the numerator of the sum: multiply all the denominators together for the denominator of the sum. Thus, for—

$$\begin{array}{rl} \frac{2}{3} + \frac{3}{7} + \frac{4}{5} & \text{which is } \frac{199}{105} \\ 2 \times 7 \times 5 = 70 & \left.\right\} \\ 3 \times 3 \times 5 = 45 & \left.\right\} \text{Add} \\ 4 \times 3 \times 7 = 84 & \left.\right\} \\ \overline{199} & \text{numerator} \\ 3 \times 7 \times 5 = 105 & \text{denominator.} \end{array}$$

To add decimal fractions, arrange them so that the decimal points shall fall under one another, proceed as in common addition, and let the decimal point in the sum total be placed under the other decimal points:—

$$\begin{array}{rr} 2{\cdot}61 \quad & 14{\cdot}103 \\ {\cdot}04 \quad & 1{\cdot}04 \\ {\cdot}118 \quad & 118\phantom{{\cdot}000} \\ \hline 2{\cdot}768 \quad & 133{\cdot}143 \end{array}$$

To add algebraical quantities, write them all one after another, without changing any sign, and connect the terms, which before had no sign, with the rest, by the sign +. Thus $a+b$ and $a-2b$ added, give $a+b+a-2b$. This is the sum, which may be reduced to a simpler form, by observing that b subtracted twice and added once, is equivalent to b subtracted once, and that a is added to a. The expression then becomes $2a-b$.

When the quantities are fractional, the preceding rule follows the application of another similar to the rule in fractional arithmetic. Thus, for

$$\frac{a}{a+b} + \frac{b}{a-b} \text{ the sum of which is } \frac{a^2+b^2}{a^2-b^2}$$

$$\begin{array}{rl} \left.\begin{array}{r} a \times (a-b) = a^2 - ab \\ b \times (a+b) = ab + b^2 \end{array}\right\} & \text{Add} \\ \overline{a^2 - ab + ab + b^2} & \\ \text{or} \quad a^2 + b^2 & \text{numerator} \\ (a+b) \times (a-b) = a^2 - b^2 & \text{denominator.} \end{array}$$

For further information, see *Library of Useful Knowledge, Algebra*, pp. 4, 22; *Study of Mathematics*, pp. 15, 22.

ADDITION of RATIOS. A phrase which may, perhaps, at first, puzzle the mathematical student who reads old books, and which we therefore explain here. Take two ratios or proportions, say 3 to 7 and 5 to 9; the ratio of 3 × 5 to 7 × 9, or of 15 to 63 was formerly said to be the *sum* of the ratios of 3 to 7 and 5 to 9. Similarly the ratio of

25 to 4 was said to be *double* of the ratio, or the *duplicate ratio*, of 5 to 2; that of 125 to 8, *triple*, or the *triplicate ratio*, and so on. [See Ratio, Logarithm.] The sum of the first ratios in any more modern work would probably mean $\frac{3}{7}+\frac{4}{9}$; but the term 'sum of the fractions, would most likely be used in preference.

ADEL, the name of a portion of eastern Africa, which it is not possible to describe with much precision. The name of Adaiel is sometimes given to that part of the African coast which runs from the straits of Bab-el Mandeb, the entrance of the Red Sea, to the bay and town of Zeila; and the name of Adel, or the land of the Somaulis, is extended as far as cape Guardafui. The chief place of the Somaulis is Berbera, to which the Arabs cross over from Aden and from Mocha, between October and April, to purchase gums, myrrh, frankincense, slaves, camels, horses, mules and asses, for which they give in exchange Indian wares. The inhabitants of unknown districts in the interior send caravans to Berbera with ivory and gold dust; and this is now the only channel of communication between the interior of central and southern Africa and the S.W. coast of Arabia. The Somaulis, sometimes called Berberes, have, according to some accounts, long hair and an olive complexion, but, according to Valentia, woolly hair and a very black-skin, though they are not negroes. They possess ships of their own, and are active, enterprising merchants; some of them have settled at Mocha in Arabia. Zeila is in N. lat. 11° 18′, E. lon. 43° 3′; and this or Berbera is the best point from which a traveller could set out to explore the southern boundaries of the Abyssinian provinces, and the upper waters of the Bahr el Abiad; the caravan communications already existing through Hurrur, which borders on the territory of Zeila, and running westward towards the supposed sources of the Nile, would render an attempt to penetrate into the interior probably not very hazardous. The horns of the cows of Adel are said to be very large, and probably the animal may be akin to the Galla oxen which Salt saw in Abyssinia, and which are brought from the south. A species of large-tailed sheep exists in this country, and the hair is rough like bristles.—[Valentia—Salt—Malte-Brun.]

ADELUNG, JOHANN CHRISTOPH, the well-known German grammarian and universal linguist, was born at Spantekon, a village near Anklam in Pomerania, on the 8th of August, 1732. He received his first education at the town-school of Anklam, and at Kloster-Berge, near Magdeburg; and afterwards visited the university of Halle. In 1759 he was appointed a professor in the evangelical gymnasium at Erfurt: but he held this situation only till 1761, when, in consequence of a dispute with the Catholic town-magistrates about a point of difference in religion, he found himself under the necessity of leaving Erfurt. Adelung now went to Leipzig, where he continued to reside till 1787. He supported himself by literary labours, and chiefly by translations of valuable works of foreign literature. The number of volumes which he thus prepared for the press, and many of which he enriched with extensive additions of his own, is surprisingly great. Among them, his *Glossarium manuale ad scriptores mediæ et infimæ Latinitatis*, (Halle, 1772-84, 6 vols. 8vo.) founded upon the previous labours of Du Cange and Charpentier, deserves particular notice. Besides these numerous translations and compilations, Adelung found leisure to prepare his critical dictionary of the High-German language. (*Grammatisch-kritisches Wörterbuch der Hochdeutschen Mundart.*) The plan of this work had already been projected by Gottsched, whom death prevented from following it up (1766), and who left but scanty materials for its execution. Adelung now turned his whole attention to the language of his native country, and several valuable works (*Deutsche Sprachlehre für Schulen*, Berlin, 1781, 8vo., *Umständliches Lehrgebäude der Deutschen Sprache*, Leipzig, 1782, 2 vols. 8vo., &c.) were the result of the profound study which he gave to this subject. In 1787 Adelung was called to Dresden and appointed principal librarian to the electoral library there. The important documents for Saxon history and antiquities which were now under his care, attracted his attention, and induced him to publish several works of deep research on the history and ancient institutions of the state which he served. Soon, however, his old predilection for philological and linguistic inquiries returned, and he formed the plan of his *Mithridates*, a work which he intended should contain a succinct historical account of all the known languages of the earth, with a translation of the Lord's Prayer, given as a specimen of as many as could be procured. Death prevented him from carrying this vast project into execution. Adelung died on the 10th of September, 1806, only a few months after the first volume of the *Mithridates*, giving an account of the Asiatic languages, had appeared. The plan of the work was afterwards taken up by Johann Severin Vater, who completed the whole in four volumes.—[See the article 'Adelung,' by Ebert, in Ersch und Gruber's *Encyclopädie*, vol. i.]

ADEN, a town of Yemen, one of the great divisions of Arabia, on the coast of the Indian Ocean, and nearly due east of the entrance of the Red Sea, N. lat. 12° 40′. E. lon. 44° 48′. The town stands on the east side of a small peninsula, or rather island, which is connected with the mainland by a causeway on seven arches, through which the sea rushes at high-water. The great gulf formed by that part of the African continent terminating in Cape Guardafui, and the opposite coast of Arabia, is sometimes called the gulf of Aden. This town has declined from its former importance, but is still the chief mart for the gums brought from Africa by the Somaulis, and is also noted for good coffee. Salt (p. 106) describes the place as a wretched heap of ruins and huts, situated under a scorching climate and inhabited by an unhealthy looking race of Arabs: the lower classes are very depraved in their morals. On the north and west sides of the town there is a very steep mountain, on the highest pinnacles of which still stand some old towers, erected by the Turks. The former more prosperous condition of this place is shown by the large and deep cisterns excavated in the rock, lined with stucco, on the N.W. side of the town, to which the water was brought from a ravine in the mountain by a broad aqueduct that may still be traced. Salt saw another cistern entire higher up the mountain, and backed by some large masses of granite. Salt has given, in his 'Voyage to Abyssinia,' a small sketch of Aden, taken from outside the harbour, and also a map of 'Aden Back Bay.'

ADHESION. This term has generally been employed to denote the property by which two solids, a solid and a fluid, two solids and an interposed fluid, or two fluids, remain attached to each other when their surfaces are brought into contact. Adhesion, in some instances, may be considered as little if at all different from cohesion, and dependant upon the same cause, while, in other cases, it appears to be connected with, and probably to a considerable extent derived from, chemical affinity; when, for example, two surfaces of lead are pressed together, the adhesion resembles mere cohesion, it acts at insensible distances like that power, and no change of properties ensues in the metal. If, however, the surface of a piece of lead is put into contact with mercury, the two metals act upon and combine with each other, and an amalgam is produced by chemical affinity. There are other instances in which the adhesion is not distinctly to be referred to cohesion, and in which it certainly does not depend upon chemical affinity, as when a plate of glass adheres to the surface of mercury, or liquids rise in small tubes by capillary attraction.

Among the earlier attempts to determine the force of cohesion are those of Dr. B. Taylor, in a paper on magnetism (*Phil. Trans.* 1721). He performed various experiments to ascertain the force of adhesion between wood and water, by determining the force in weight required to separate them. He found it to be directly as the surface, and that a square inch of wood required fifty grains to raise it from the water.

M. Achard (*Berlin Memoirs*, 1776) made a vast number of experiments on the force of adhesion between plates of glass of different diameters, and many liquids, and upon the adhesion of twenty different substances with as many liquids. It had been supposed that adhesion was derived from atmospheric pressure, but M. Achard found that by varying the pressure no change occurred in the adhesive force of glass and water; and that the adhesion of fluids to solids was uniformly in the inverse ratio of the temperature. The diminution in the force of adhesion by increase of temperatures was attributed by Guyton de Morveau to the rarefaction of the fluid by heat, and the consequent reduction of points of contact in the same space

As the surfaces of the solids employed by Dr. Taylor and M. Achard must have been wetted by the liquids, it has been objected to their experiments, and especially by M. Dutour in the *Journal de Physique*, that they do not prove any adhesion between the solid and the liquid, but cohesion between the two portions of the liquid which have been separated. If this objection be valid, then those only can be considered as proper cases of adhesion, in which no particle of one substance remains with the other after the separation of their surfaces, as when glass is separated from mercury; M. Dutour found that a disc of glass 11 lines (French) in diameter adhered to mercury with a force of 194 grains.

M. Guyton published in 1777 in his *Elémens de Chymie*, a series of experiments on the force of adhesion between eleven metals and mercury; his method was as follows:—the metals were perfectly pure, circular, and one inch in diameter; they were all of the same thickness and suspended from a ring in the centre at the arm of an assay-balance and counterpoised; the plates were then applied to the surface of the mercury, which was changed in each experiment, and the weights required to detach them were as follows:—

	Grains.		Grains.
Gold	446	Zinc	204
Silver	429	Copper	142
Tin	418	Antimony . . .	126
Lead	397	Iron	115
Bismuth . . .	372	Cobalt	8
Platina	282		

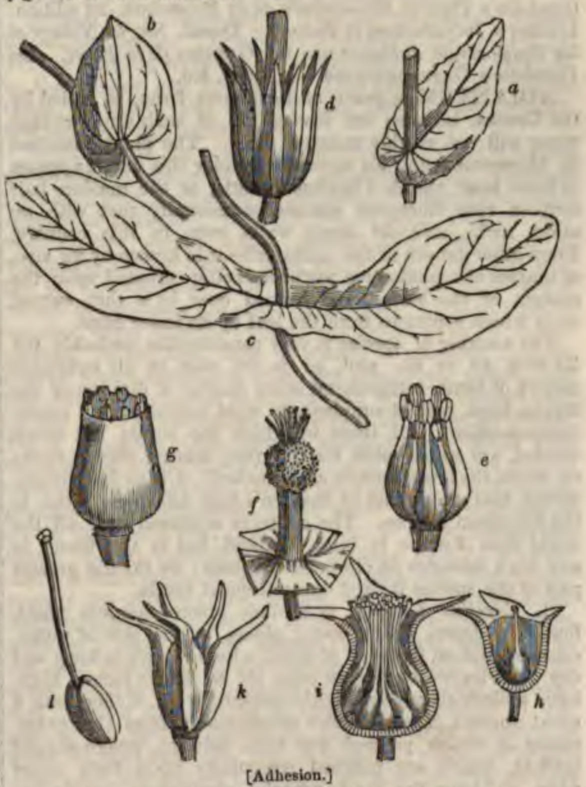
In these experiments the phenomena of adhesion appear to depend upon the degree of chemical affinity existing between the mercury and the metals applied to its surface. If the affinity be weak, the two surfaces will separate by the application of a slight force. Indeed, M. Guyton himself considers that the weight required to separate the different metals from mercury may directly express their affinity for it. It will be evident on a moment's consideration that the degree of adhesion is perfectly independent of the densities of the different metals.

The sixty-third volume of the *Philosophical Magazine* contains a paper by Mr. Bevan, in which the subject of adhesion appears to be considered in a point of view which had previously excited but little attention, viz., the real force of adhesion of different nails when driven into wood of different species; the weight, without impulse, necessary to force a nail a given depth into wood, and the force required to extract the same when so driven. The term adhesion in this case is applied to the force, whether arising from friction, or cohesion, or partly from both, with which wood resists the drawing out of a nail. Mr. Bevan has given a table of the adhesion, &c. of different kinds of nails when driven into dry Christiania deal; in this table it appears that a sixpenny nail, 73 to the lb., 2½ inches long, forced 1½ inch into the wood, required 327 lbs. weight to extract it; the percussive force required to drive the sixpenny nail to the depth of one inch and a-half into the dry deal, with a cast-iron weight of 6·275 lbs., was four blows or strokes falling freely, the space of 12 inches, and the steady pressure to produce the same effect was 400 lbs. With different kinds of timber the results varied greatly, and Mr. Bevan concludes that a sixpenny nail driven two inches into dry oak, would require a force of more than half a ton to extract it by steady pressure. Mr. Bevan (*Phil. Mag.* and *Annals of Philosophy*, vol. ii., p. 291) has also determined the force required to draw screws out of different kinds of wood; the screws used were about two inches in length, .22 diameter at the exterior of the threads, .15 diameter at the bottom, the depth of the worm or thread, being .035, and the number of threads in one inch = 12. These screws were passed *through* pieces of wood, exactly half an inch in thickness, and drawn out from the following dry woods by the annexed weights, beech 460 lbs., ditto 790 lbs., ash 790 lbs., oak 760 lbs., mahogany 770 lbs., elm 655 lbs., sycamore 830 lbs. The force required to draw similar screws out of deal and the softer woods, was about half the above.

ADHESIONS, Theory of, in Botany, is the basis of much of the philosophical part of that science, and forms one of the most striking points of difference between the doctrines of the present and preceding schools. It shows that many of the varied characters, which cause so endless a diversity of appearance in the vegetable kingdom, originate in the adhesion of a few very simple organs; and that what we are accustomed to consider parts of extremely different nature, only seem so in consequence of the way in which such adhesion occurs. Thus, the stem of a tree is not a homogeneous mass of vegetable matter, perforated by holes, or filled by little cavities caused by the extrication of air in it when in a soft state, but is produced by the adhesion of certain elementary bodies called Cellular Tissue, Fibrous Tissue, and Vascular Tissue (see ELEMENTARY ORGANS), arranged in a definite manner, which varies with species; neither is a leaf, or a fruit, or a flower a mere mass of pulp, or an expansion, like the horn of an animal, but also consists of these same elementary organs in a state of adhesion. To gardeners it has been long known that the property of adhesion between contiguous parts exists to a certain degree; for the operation of grafting or budding a portion of one plant upon another is dependent upon it. They also know that if two cucumbers, or two apples, or even two hard branches be artificially placed in contact when in a growing state, they will adhere, so as to become what may be called vegetable twins; and that the same phenomenon sometimes occurs constantly in certain cultivated plants, of which an instance is furnished by the cluster golden pippin apple, whose fruit is usually twin.

Guided by these well-known facts, modern botanists have discovered that the property of adhesion explains the true nature of every organ that plants bear, and that there is none so anomalous which cannot be shown to owe its appearance in a great measure to the union of contiguous parts. As it is very important that this should be clearly understood by all who make Botany their study, we shall proceed to give several illustrations of it.

Some leaves are said to be stem-clasping or amplexicaul, when their base partially surrounds the stem (*fig. a*); while some stems are said to be perfoliate, when they seem as if they pierced through the leaf, as in Bupleurum rotundifolium (*fig. b*); but the latter differ from the former only in this, that in the first the lobes at the base of the leaf embrace the stem without adhering, while in the second they not only clasp the stem but grow together where their margins come in contact. Some leaves are hollow, as in the pitcher plant, and these were formerly thought to be special organs with which no analogy could be discovered; they are now known to be leaves which have rolled up so that their opposite margins come in contact and adhere. Other leaves, growing from opposite sides of a stem, adhere in consequence of their bases becoming connate (*fig. c*), as in the honeysuckle; and finally there are others, many of which grow, in what botanists call a whorl, that is to say, all round a stem upon the same plane, and adhere by their margins into a sheath (*fig. d*), as in Casuarina.



[Adhesion.]

In other organs adhesions of a similar nature occur.

In the calyx all the sepals, or parts, are often distinct, as in the ranunculus; but they also often adhere by their edges, into a sort of cup, as in the cherry. Botanists used to consider the former as composed of many leaves, and the latter as composed of but one leaf, cut at the edge into a certain number of lobes. In the corolla the petals are either all separate, as in the rose, or they adhere by their edges into a cup or bell, as in the different heaths, Campanula, and the like; while the first was called many-petaled, the second were called one-petaled, it being thought, as in the case of the calyx, that it was a single petal of a special kind, cut into lobes at the margin.

Similar adhesions take place between the stamens. In the rose they are all distinct from each other; in the geranium they slightly adhere at the base (*fig. e*); in the mallow they adhere into a tube, except near the upper extremity, where they are not united, and have their ordinary appearance (*fig. f*); in other plants they grow together into a solid tube in which no trace of separation can be discovered, as in the genus Guarea (*fig. g*).

Finally, in the pistillum there are certain parts called carpella, each of which is a hollow body terminated by a style and stigma. These carpella are hollow, because they are formed of a flat organ doubled up so that its edges come in contact, and adhere to each other. Sometimes only one carpellum is present in a flower, as in the cherry (*fig. h*); sometimes several, as in the rose (*fig. i*). The adhesions in the latter case cause many of the differences we observe in the structure of fruits; for instance, an apple is composed of five such carpella, adhering to each other and to the calyx; an orange is composed of many such carpella, each of its lobes being one. In the nigella, the styles of the carpella are all distinct (*fig. k*), but in the lily and the myrtle (*fig. l*), the styles of the carpella adhere so completely that there seems to be but one. In the apple, the calyx seems to grow from the top of the fruit; this is caused by the carpella having at a very early period adhered to the inside of the calyx, which afterwards grows with their growth, and, finally, leaves its extremities in a withered state near the top of the carpella: in the cherry, on the contrary, no adhesion ever takes place between the carpellum and the calyx; and, consequently, when the fruit is ripe, there is no trace of the latter upon its upper end. In the raspberry, the fruit is enabled to slip like a thimble from off the receptacle, because the carpella all adhere by their sides.

For further information upon this subject consult De Candolle's *Théorie Elémentaire de la Botanique*, 2d edition. Lindley's *Introduction to Botany*. Dunal, *Sur la Nature et les Rapports de quelques-uns des Organes de la Fleur*. De Candolle's *Organographie Végétable*, &c.

ADIANTUM, a genus of dorsiferous ferns, so called by the Greeks, because the leaves are of such a nature that water will not readily moisten them. The plant described by Hippocrates and his successors under this name, appears to have been the A. Capillus Veneris, or the maiden-hair fern—a rare European species, occasionally met with on moist rocks, and old damp walls, even in this country. From other genera of the same tribe it is known by its size, or masses of reproductive particles, being situated upon the margin of the leaves, and carried over by a thin curved scale which separates from the leaf by its inner edge.

The number of species is very considerable, probably not far from 80 or 90, and, as is the case in all extensive genera of ferns, comprehend every degree of division of the leaves, from perfect simplicity to what botanists call supra-decomposition. All those in which the leaves are much divided, are remarkable for the very delicate elastic stalks on which the broad leaflets are attached; it is to this circumstance that the name of maiden's-hair has been given to the European species. The genus is scattered over all the world from Europe to New Zealand, but is not found in any high latitudes in either hemisphere; by far the greater part of the species inhabit damp tropical woods.

A. Capillus Veneris, is a dark green stemless plant, found in damp, sharp, rocky places, by the side of water-courses, and on the edge of wells, where the air is keen and dry. Its leaves, which are from six to fifteen inches high, have a blackish-purple, highly-polished stalk, divided into a great number of very slender ramifications, from the extremities of which proceed the thin, delicate, wedge-shaped leaflets, which are notched irregularly upon their upper edge, and have the most graceful appearance imaginable when growing a little above the eye, and gently agitated by the wind. Wonderful medicinal properties were once ascribed to this species, but they have long since been discovered to have no existence except in the exaggeration of fanciful practitioners. All that can be discovered in it is, a slight but pleasant aromatic flavour; the French occasionally use it in slight coughs. *Capillaire* is prepared by pouring boiling syrup upon the leaves of this species, or of *A. pedatum*, an American plant of larger growth and far less divided leaves; a little flavour is afterwards given with orange-flowers.

ADIGE, the Athesis of the Romans, called by the Germans Etsch, is a considerable river of North Italy, which has its source in the Alps of Tyrol above Brixen; it enters Italy by Bolzano and the valley of Trento, flows in a southern direction by Roveredo, parallel to and for the most part about 6 miles from, the lake of Garda, then turning abruptly towards the east, passes through Verona and Legnago; it afterwards enters the great Delta between the Brenta and the Po, and forming several branches, empties its waters into the Adriatic Sea. Below Verona it is from 3 to 500 feet wide; and from Legnago, its general course may be considered as parallel to that of the Po. It is a deep and rapid stream, dividing by its course the old Venetian territories from Lombardy proper. On its banks many a battle has been fought for the possession of Northern Italy.—[See ARCOLE.]

ADIPOCIRE. A substance so named from *adeps* fat, and *cera* wax, because it possesses the properties partly of fat and partly of wax; it is a body of a peculiar nature, being intermediate between fat and wax, and bearing a close resemblance to spermaceti. This name was given by M. Fourcroy in 1786, to the substance in question, which he discovered on examining a piece of human liver that had remained for ten years exposed to the air in the laboratory of M. Poultier de la Salle. In the same year Fourcroy had the opportunity of observing an accumulation of adipocire on a scale of prodigious extent, under circumstances of a peculiar nature, which are highly curious. There was in Paris an immense burial-ground, called La Cimetière des Innocens. This place had been the receptacle of the dead for a considerable part of the population of Paris for several centuries. On account of some improvements in the neighbourhood it was determined to remove this cemetery. The number of burials in this place had amounted to some thousands annually. The bodies were deposited in pits or trenches about thirty feet deep; each pit was capable of holding from twelve to fifteen thousand bodies; and as the pits became full they were covered with a few feet of earth. The extent of the whole area was about seven thousand square yards, and this space became at last occupied by a mass which consisted almost entirely of animal matter, rising several feet above the natural level of the soil. Scientific men were specially charged by the government to direct the precautions requisite for securing the health of the workmen in removing this immense mass of putrefying animal matter; among whom were Fourcroy and Thouret, the latter of whom has given a most interesting account of the circumstances attending the opening of the ground, and the former an analysis of the new and singular object that presented itself for investigation. The most remarkable change was found in the bodies that had been heaped together in the trenches. The first of these trenches opened in the presence of Fourcroy, had been closed for fifteen years The coffins were in good preservation; the covers being removed, the bodies were observed at the bottom, leaving a considerable distance between their surface and the cover, and flattened, as if they had suffered a strong compression; the linen which had covered them was slightly adherent to the bodies; beneath the linen was found nothing but irregular masses of a soft ductile matter of a grey-white colour, resembling common white cheese, the resemblance being more striking from the print which the threads of the linen had made upon its surface. The bones, which were surrounded by this matter, had no solidity, but were readily broken by sudden pressure. The head was environed with this peculiar matter; the face was no longer distinguishable; the mouth was disorganized; no trace remained of the viscera of the thorax and abdomen, which were all confused together, and converted into this fatty matter; and this was also invariably the case with the brain. None of this matter was found in bodies isolated from each other, but only in those accumulated in the common graves. From various observations it was found that this fatty matter was capable of enduring in these burying-places for thirty or forty years, but that ultimately it became corroded and was dissipated.

This substance, thus presented for examination under such remarkable circumstances, is considered by M. Fourcroy as an ammoniacal soap, formed of a peculiar oil combined with ammonia. Its properties are, that it melts at about 130° Fahrenheit; by a strong heat it is decomposed with the solution of ammonia. Alcohol acts but slightly upon it at common temperatures, but when boiling dissolves about one-fourth of its weight, the greater part of which separates on cooling in small acicular crystals. Lime, potash, and soda decompose adipocire with the solution of ammonia. It is decomposed by nitric acid with the production of nitric oxide, and by sulphuric acid with the development of charcoal. M. Chevreul (*Recherches sur les Corps gras*) finds that adipocire consists of a large quantity of margaric acid, and a small quantity of oleic acid, combined with a little ammonia, potash, and lime.

Different opinions have been entertained as to the nature of the operation by which adipocire is produced. From the experiments of Dr. Gibbes (*Phil. Trans.* 1794), it would appear that muscular flesh, when buried in moist earth, is, by a peculiar kind of decomposition, scarcely to be considered as putrefaction, converted into adipocire; and this change he found was expedited by exposure to running water.

M. Gay-Lussac has stated it as the opinion both of himself and M. Chevreul, that the apparent conversion of flesh into adipocire is merely a deception; and is nothing more than the wasting of the muscular fibres, while the fat remains. The experiments on which this conclusion are founded (*Ann. de Chim. et de Phys.* iv. 71) are these:—fibrin of blood was kept in water, renewed once every two or three days for three months; it all wasted way, and no fat whatever remained. Muscle of beef and liver being treated in the same way, some fatty matter remained. Dr. Thomson states that a body which had lain in a moss in Scotland for more than a century, was examined a few years since, and found to be entirely converted into a hard saponaceous matter; a portion cut from the thigh was chiefly adipocire; and the quantity of fatty matter was much too large to suppose it to have pre-existed in the living body. To this may be added another similar case observed by Sir E. Home and Mr. Brande, and published in the *Philosophical Transactions* for 1813.

By the action of dilute nitric acid upon lean flesh, Dr. Gibbes obtained a substance which he considered as exactly similar to the adipocire produced in the mode already described. Dr. Bostock (*Nicholson's Journal*, 8vo., vol. iv. p. 135) also formed adipocire by the agency of nitric acid; it is, however, most probable that the result of the action of the acid is essentially different from the true adipocire.

A'DIPOSE SUBSTANCE, *adeps*, fat. **ADIPOSE TISSUE**, *Tela adiposa*, Latin; *Tissu graisseux*, Fr.

Adipose substance, or fat, is an animal oil, which resembles, in its essential properties, the vegetable oils. It is wholly inorganic, though contained in an organized tissue. It varies in its consistence, or rather in the temperature at which it becomes solid. In general, it forms a pretty firm solid, constituting suet, which, when divested of the membrane in which it is contained, is called tallow; but there are animals in which, at the ordinary temperature of the atmosphere, it always remains fluid, as in the cetacea. At the temperature of the human body, it is fluid. It is therefore conceived, that during life it must exist in a fluid or semi-fluid state; though, when observed in the living body, as when incisions are made through the adipose membrane, either in the human subject or in animals, it appears as a soft, yielding, compressible substance, with a slight degree of translucence. There is reason, however, to conclude that this degree of firmness, as well as the general appearance which it exhibits in the living subject, is wholly derived from the organized membrane in which it is contained.

Human fat, when separated from the tissue in which it is deposited, is of a whitish-yellow colour, and the colouring matter, being soluble in water, is capable of being removed by washing. It is white and transparent in proportion to the youthfulness of the subject, the yellow colour increasing with age. When purified, it is perfectly white, inodorous, and of a mild, insipid taste. It is lighter than water, and burns with rapidity. By exposure to air and light it becomes rancid, and gives off a volatile acid, which has a strong odour. It is one of the few animal substances which does not contain azote; its ultimate elements are carbon, hydrogen, and oxygen. Bérard has succeeded in producing, artificially, a substance very analogous to animal fat. On mixing together one measure of carbonic acid, ten measures of carburetted hydrogen, and twenty of hydrogen, and transmitting the mixture through a red-hot tube, several white crystals were obtained, which were insoluble in water, soluble in alcohol, and fusible by heat into an oily fluid.

Until recently, it was conceived that fat is a simple principle, constituting one of the elements of the animal organization: but M. Chevreul, who has examined this substance with extraordinary diligence, has demonstrated that it is not a simple principle; but that it consists of two substances which are capable of being separated from each other, and obtained in a distinct form. Of these substances, one, at the ordinary temperature of the atmosphere, is solid; the other fluid. To the solid substance he gives the name of *stearine*, from στέαρ, fat or suet, and to the fluid substance *elaïne*, from ἔλαιον, oil. Stearine, the solid portion of fat, is a substance colourless, tasteless, nearly inodorous, soluble in alcohol, separable from this solution in the form of small, silky needles, and preserving its solidity at a temperature of 99° Fahrenheit. Elaïne, the oily principle of fat, is fluid at the temperature of 60° Fahrenheit; it is of a yellow colour, without odour, lighter than water, its specific gravity being 0·913, and easily soluble in alcohol. The difference in the fluidity, or the melting point of the fat of different animals, depends on the proportions in which these two substances are combined; in the more solid the stearine, in the less consistent the elaïne, being in excess.

The chemical processes by which these substances are obtained are simple. Adeps, tallow, or fixed oil, is dissolvable in very pure, hot alcohol; the stearine separates from the solution by crystallization, assuming the form, as has been already stated, of fine silky needles, while the elaïne is procured by the evaporation of the spirit. There is a still simpler process. Fixed oil is congealed by a low temperature; the mass is then pressed between folds of bibulous paper; the elaïne soaks into the bibulous paper, and the stearine remains in a separate form; when the bibulous paper is pressed under water, the oily matter which escapes is pure elaïne. The changes that take place when the constituent principles of fat combine with an alkali, as potash, will be explained in the article SOAP.

Animal fat is contained in a distinct membrane, termed the adipose tissue. The adipose is formed of the CELLULAR TISSUE, but the arrangement of the fibres is widely different in the former and the latter. The fibres of the adipose tissue are larger and tougher than those of the cellular, and form a much coarser web.

According to the most eminent anatomists, the structure of the adipose tissue consists of rounded packets, separated from each other by furrows; each packet is composed of small spheroidal particles; each particle is again divisible into still smaller grains, which present the appearance of vesicles, or minute bags or sacs, and it is in these bags that the fat is contained. The knife of the anatomist cannot indeed demonstrate the membranous walls of these adipose vesicles; but, though too fine and delicate to be distinguished by the eye, there is reason to conclude that the adipose tissue forms sacs which are completely closed, and that it is so arranged as to render each vesicle a distinct bag, having no communication whatever with any other vesicle. For, if a portion of the adipose tissue, recently taken from the body, be placed in warm water, of a temperature greater than is sufficient to melt the fat, not a drop of oil will escape, provided the temperature of the water be not sufficient to injure the membrane; but if incisions be made through the tissue, the oil instantly begins to issue from it; showing that the walls of the oil bags are divided, and that consequently the oil flows out. Again, though fat be fluid at the temperature of the human body, yet the adipose masses preserve a constant and definite form, which could not be the case unless the oil were inclosed in a solid sufficiently dense and resisting to maintain that form. Lastly, in however large a quantity the fat may be accumulated in any part of the body, it cannot by any degree of pressure be made to pass from one part to another; while the facility with which the cellular membrane permits the transmission of fluids through its cells from one extremity of the body to the other, is one of the most striking characters of that tissue. Neither in the fullest distension of the cellular tissue with fluid does a single particle ever penetrate the adipose vesicles; they never contain anything but their own proper substance.

There is reason to believe that the fat is immediately formed out of the blood, without any glandular apparatus for secreting it, by the capillary arteries of the adipose vesicles. In the furrow between each packet is placed the branch of an artery and vein. These vessels divide and subdivide to an extreme degree of minuteness, penetrating and terminating in the vesicles of which the packet is composed. In these vesicles the ultimate or capillary arteries, by a process, the nature of which is wholly unknown, separate adipose matter from the blood which is flowing in them, and deposit it in the vesicles. By chemical analysis, the materials of fat, like those of all the other secretions, are found to be contained in the blood; but in what mode the fat is separated from the blood we are wholly ignorant. It is probable, however, that the blood receives the oily principle of fat from the chyle, which is the nutritive matter formed by the process of digestion, in which it is ascertained to be present in large quantity.

As diffused over the body, the adipose membrane consists of masses which vary considerably in their magnitude and shape. In some places they are rounded, in others pear-shaped, and in the median line of the abdomen, egg-shaped. The distribution of the membrane is exceedingly unequal. There is, in general, a considerable layer immediately beneath the skin; and especially between the skin and the abdominal muscles, where it occasionally accumulates in enormous masses. Between the folds of the membranes which form the OMENTUM and MESENTERY, there is usually a large quantity; also around the heart and the kidneys; on the face, and especially on the cheeks, and in the orbits of the eyes; in the palms of the hands, the soles of the feet; the pulp of the fingers and toes, the flexures of the joints, the fibres of muscles, and the sheath of vessels. In most of these organs it never entirely disappears, whatever be the degree of leanness to which the body may be reduced; while in the cranium, the brain, the eye, the ear, the nose, and several other organs, there is none, whatever be the degree of corpulency.

The function which the adipose substance performs in the animal economy is not very apparent. Being a bad conductor of caloric, it cannot have much influence (though the fat immediately beneath the skin may have some) in maintaining the heat of the body, since the chief portion of it is situated deep in the system, and is placed around the internal viscera. Yet, it certainly accomplishes more than one purpose of no slight importance. 1. In the first place, it is probable that its accumulation in the system serves as a reservoir of inflammable matter for the generation of animal heat, and that it often actually maintains a process of combustion no less than the oil of the lamp. The phenomena of life present nothing more curious and interesting than the provisions which are made for the production and support of animal heat, as will be fully shown hereafter. (See HEAT, ANIMAL.) Animal heat is generated by the union of the carbon of the blood with the oxygen of the air, and the consequent formation of carbonic acid, the evolution of heat invariably attending the formation of this acid. By the process of digestion chyle is formed; chyle contains a large portion of carbon: this carbon is poured into the great venous trunks of the system, and, in a mode which will be explained hereafter, is immediately carried to the lungs by the great vessel that springs from the right heart. In the lung it is consumed, in the formation of carbonic acid gas, for the production of animal heat; and the large supply required for the continual maintenance of this process is, under ordinary circumstances, afforded by the chyle. But suppose this supply to fail; then immediately the absorbent vessels take up, from its various receptacles, the adipose matter accumulated in the system, and convey it to the veins; the veins transmit it to the lung, and thus the lung is supplied with the necessary quantity of carbon for the generation of carbonic acid, and the consequent production of animal heat. 2. In the second place, it serves a most important use in obviating the effects of excessive nutrition. When too much food is taken, or when the secretions and excretions are suppressed, grievous evils would arise, and often death would ensue, if there were no provision for the removal of this superfluous matter. One of the most important of these provisions is the deposition of fat, by which the system is lightened of a burthen; and the circulating system especially is relieved of a fulness and tension of its vessels, which might induce in them a fatal state of action. The secretion of fat from the blood, and the deposition of it in its various receptacles, is thus one of the safety valves of the constitution. The generation of it under circumstances favourable to its formation, that is, under circumstances which put the system in danger, either from the quantity or the quality of the blood, is extremely rapid. In man, no other solid is ever formed as quickly as this sometimes is; but in some animals, in certain states of the atmosphere, a prodigious accumulation of it is said to take place in the course of a few hours. Bichat states that during a fog of twenty-four hours continuance, thrushes, wheat-ears, ortolans, and red-breasts, are sometimes observed to become so fat that they are unable to fly from the sportsman.

A certain quantity of fat is a sign and an effect of health; an excessive accumulation of it is a sign and a cause of disease. The quantity actually generated is influenced by a great variety of circumstances. 1. By age. At the two extremes of human life the quantity is always small. Before birth, it is less than at any other period. During the first half of fœtal existence, there is no appearance of it whatever. About the fifth month it begins to appear in isolated grains under the skin. At the period of birth, it is sometimes accumulated in considerable quantity; but even then, it is in distinct masses in no part of the body excepting beneath the skin; in the internal organs, and in every other part of the body, it is found only in small and separate grains. As the period of maturity passes into that of declining age, it is sometimes very abundant; but as old age advances, the quantity invariably diminishes; and in extreme old age it is very minute: this is one of the chief causes of the thinness so characteristic of this stage of existence. It is remarkable, too, that the situation of the fat in the aged is exactly the reverse of that in the infant. In the infant, as we have seen, there is scarcely any of this substance in the interior of the body, but almost all of it is accumulated immediately beneath the skin; and this is the cause of the plumpness and roundness of the external surface of the infant: in the old, on the contrary, whatever portion of fat remains in the system is almost all deposited in the very substance of the organs, while there is scarcely any on the external surface. 2. The quantity of fat is materially influenced by sex. In general, it is more abundant in the female than in the male. 3. By constitution. There are persons who never become fat at any period of life, however sound the health, however good the appetite, however favourable the circumstances for the formation of this substance. And this habit is often hereditary, being received from the parent and transmitted to the offspring for many successive generations. 4. By diet. Nutritious and abundant diet, consisting especially of animal food and malt liquors, conduces to its formation in large quantities; while high seasoned, spiced, or acid aliments, together with the immoderate use of spirituous liquors, check its production. 5. By the condition of the function of assimilation. If the power of assimilation (that is, the power of converting chyle into blood) be diminished, while the appetite remains unimpaired, a large quantity of chyle is flowing in the circulating stream which cannot be transformed into proper nutriment: this unassimilated, and therefore useless and pernicious chyle, is deposited in the adipose tissue, in the form of fat, and in this manner the circulation is relieved of its load. An excessive accumulation of fat in persons otherwise in sound health should therefore always excite attention; it is often the earliest indication of a diminution of the vital energy, and not, as is often supposed, a sign of vigorous health. 6. By the state of the secretions and excretions. Suppression of the ordinary secretions and excretions leads, in a way which can now be readily understood, to a corresponding and a compensating deposition of fat; while a preternatural increase of the natural evacuations, as in cholera, diarrhœa, diabetes, &c., and a preternatural increase of the discharge from the mucous surfaces, especially from those of the lungs and intestines, will prevent the deposition, and even cause the absorption of the adipose substance. 7. Active and long-continued physical exercise. Walking, running, riding, whatever species of exertion promotes the secretions and excretions, prevents the deposition of fat, as is exemplified in boxers, jockeys, and all who go through a regular system of training, of which vigorous exercise always forms a part. 8. Long-continued and intense mental exercise. Persons whose minds are acute, active, and vigorous, are seldom fat. There is no more certain or powerful means of becoming and keeping thin than hard and continuous mental labour. Among the conditions observable in all the remarkable instances on record of persons who have changed rapidly from a state of enormous obesity to a state of moderate thinness, vigorous mental exertion is one. Persons oppressed with an accumulation of fat, and accustomed to lead an indolent and luxurious life, when placed under circumstances which require great mental exertion, are invariably found to lose many pounds of their weight in a short time, and to undergo a sensible change in their general aspect; and this is owing chiefly to the absorption of the adipose substance. 9. But the accumulation of fat is influenced still more by the character than by the mere activity of the mental state. Cheerfulness and serenity of mind are highly conducive to the deposition of fat, while anxiety of mind not only suspends all further deposition, but causes an active absorption of it. The immediate cause of a sudden change from fatness to leanness is the absorption of the adipose substance. Thinness, too, is usually and justly thought to be the general accompaniment of a sour, fretful, and irritable temper. 10. Excessive sleep, together with the absence of physical and intellectual exertion, and still more, of mental anxiety, is highly conducive to the accumulation of fat. 11. Organic diseases, especially those which impede the formation of chyle, or which impede the conversion of it into blood, diminish the secretion of fat; hence persons who labour under organic diseases of the stomach and of the small intestines are invariably thin, and generally emaciated. This is also the case with those who are afflicted with diseases of the respiratory organs, such as the deposition of tuberculous matter in the lungs, by which the air-cells are choked up, and the air is prevented from coming into contact with the venous blood, and with the chyle contained in it. As the tubercles enlarge, the respiratory portion of the lung diminishes, and part after part of the organ being thus successively obliterated, the emaciation at length becomes extreme. 12. But even long-continued disorder of the system, without any organic disease, generally occasions wasting of the body, from the absorption of the adipose substance; because, in this state of the system, the processes of waste are more active than those of supply. 13. Long and intense heat, whether natural, as during hot summers, or artificial, as the heated temperature produced about furnaces, hot-houses, &c. and, lastly, long-continued abstinence, tend to diminish the quantity of fat.

Sometimes the accumulation of fat is enormous. The average weight of the human body, when well nourished, and of a medium size, is about 160 pounds, or between eleven and twelve stone; yet instances are on record of its attaining, by the deposition of fat, the weight of from thirty-five to forty stone. Dr. Cheyne mentions a case in which the weight was 448 pounds, equal to thirty-two stone. In the Philosophical Transactions are recorded two cases, in one of which the weight was 480 pounds, and in the other 500 pounds. The Breslau Collections contain two other cases, in one of which the weight was 580, and in the other 600 pounds. The inconveniences produced in the system by these enormous accumulations of fat, and the means to be adopted for preventing and removing them (for they can be prevented, and even removed, with absolute certainty, provided the health be in other respects sound), will be treated of under the term Obesity.

ADIT. [See Mining.]

A'DJECTIVE, in Grammar, the name of one of the parts of speech, or one of those great classes into which, for the sake of convenience, grammarians have distributed the words of a language. The term *adjective*, which is of Latin formation, signifies something that *adds to* precision in describing the nature of any object of which we are speaking. An adjective, in our language, is most commonly prefixed to the name of some thing, in order to mark some quality by which it is distinguished from other things belonging to the same class; thus, a *bad* man, a *good* man, a *fat* man, a *troublesome* man, &c.; a *black* horse, a *white* horse, &c. Here the terms *man* and *horse* are the most general or abstract (see Abstraction) terms by which we can express the idea of man or horse; but, by prefixing to them such adjectives as *bad*, *good*, &c., we limit, in some degree, the class of which we are speaking. Thus, when we speak of a *white* man, we exclude the consideration of black men, or men of any other colour. In like manner, when we say an *English* man, we limit the signification still further; and in this way we may descend to a Cheshire man, a Chester man, until we come to individuals indicated by a common name, such as Thomson, Smith, &c. By the aid of other words prefixed, such as John, William, &c., we at last come to some certain individual. It appears, then, that in the expressions John Page, William Smith, &c., John and William may have the names of adjectives as well as the words *black*, *white*, &c. And this leads us to observe that frequently *nouns* or names of things can be used like adjectives; thus we can say, a *silver ring*, a *gold stick*, *salt water*, *sea water*. Many words in English are, in fact, used both as nouns and adjectives. In the expression 'John's book,' *John's* may be considered as an adjective for the reasons just given. Some grammarians have wished to introduce the term *adnoun* instead of *adjective*, but though the word *adjective* is not a very good name, *adnoun* is no better.

There are two ways in which an adjective can stand in a proposition: we can say 'the horse is bad,' or 'a bad horse.' In the first example, *horse* is called the 'subject,' *is* the 'copula,' or connecting link, and 'bad' is the 'predicate' or qualifying term. According to the true idiom of our language, an adjective can stand at the end of any simple proposition, as, he walks *slow*, he rides *quick*, he speaks *loud*. It is true that usage is now beginning to be opposed to this mode of expression, and the adverb in *-ly* is gaining ground; yet there are cases where it is not possible to use the termination in *-ly* without making the spoken language at least very stiff and formal. Some words are used both as adjectives and adverbs.

Many adjectives are simple *roots*, such as *good*, *bad*, *hot*, &c., while others are formed by adding an affix or suffix to a noun.

The following list of adjectives formed by affixes, or by adding a complete word, belong to the Saxon part of our language:—

glad-some
play-ful
weight-y
wood-en
care-less
child-ish
fore-most
fork-ed
for-ward
god-like
man-ly
out-er

The following terminations are of Latin and Greek origin

act-ive
passion-ate
adamant-ine
sulphur-ic
angul-ar
duc-tile
coher-ent
attend-ant
habit-able
aud-ible
luc-id
autumn-al
period-ical
station-ary
transit-ory
Belgi-an
humor-ous
verb-ose

There are other terminations of less importance, such as *ether-eal*, *advent-itious*, &c., which agree with the examples already given, as to the *last* syllable, but differ in having an additional syllable or syllables between the first part of the word and the termination.

ADJUSTMENT, in marine insurance, is the settling and ascertaining the exact amount of indemnity which the party insured is entitled to receive under the policy, after all proper allowances and deductions have been made; and fixing the proportion of that indemnity which each underwriter is liable to bear. The contract of insurance is an agreement to indemnify the insured against such losses as he may sustain by the occurrence of any of the events which are expressly, or by implication of law, contained in the policy. Thus, when a ship is lost, or any of those contingencies arise against which the insurance provides, the owner of the ship or of the goods insured, as the case may be, or an authorized agent, reports the circumstance to the insurers or underwriters. In London, this notice is given by an insertion in a book kept at Lloyd's Coffee-House in the subscription-rooms, where the greater part of marine insurances are effected.

Before any adjustment is made, the underwriters require to be informed of all particulars, that they may be satisfied the loss has occurred through circumstances against which the insurance was effected. In ordinary cases the task of ascertaining these facts, and of examining the correctness of the demand made by the assured, rests with the underwriter who has first subscribed the policy. In complicated cases of partial, or average losses, the papers are usually referred to some disinterested party, who makes a profession of such references, to calculate and adjust the per centage rate of loss. Where the ship is wholly lost, of course little difficulty occurs in this part of the inquiry; but in cases of partial losses, where the insured has not exercised his right of abandonment (see ABANDONMENT), very minute and careful examination often becomes necessary. The quantity of damage being ascertained, the amount which each underwriter has made himself liable to by subscribing the policy is settled; and this being done, it is usual for one of the underwriters, or their agent, to indorse on the policy, 'adjusted a partial loss on this policy of so much per cent.' To this indorsement the signature of each underwriter must be affixed, and this process is called the adjustment of the loss.

After an adjustment has been made, it is not usual in mercantile practice for the underwriter to require any further proof, but at once to pay the loss; and it has been said that the reason for which adjustments have been introduced into the business of maritime insurance is, that upon the underwriter signing an adjustment, and thereby declaring his liability, and admitting that the whole transaction is adjusted, time should be given him to pay the money. As a question of law, however, it is undecided how far the adjustment is conclusive and binding upon the underwriters; the better opinion appears to be that the adjustment is merely presumptive evidence against an insurer, and has only the effect of transferring the burden of proof from the assured to the underwriters; that is, where an adjustment has taken place, and the liability to pay the loss is disputed, the adjustment alone, without further proof, will be sufficient to entitle the insured to recover in an action on the policy, unless the under-writer shows facts which may have the effect of relieving him from liability. It is much to be lamented that a question of such importance in commercial transactions should not have received a solemn decision.—[See Selwyn's *Nisi Prius*, title *Insurance*; Park, on the *Law of Marine Insurance*, and a note to Campbell's *Nisi Prius Reports*, vol. i., p. 276.]

ADJUTANT, a military officer, attached to every battalion of a regiment. The office does not confer a separate rank, but is usually given to one of the subaltern officers. The duties of an adjutant are to superintend (under the major of the regiment, and the adjutant-general of the army) all matters relating to the ordinary routine of discipline in the regiment; to receive and promulgate to the battalion all general, garrison, and regimental orders, signing them in the orderly-book on the part of the commanding-officer; to select detachments from the different companies, when ordered; to regulate the placing of guards, distribution of ammunition, &c.

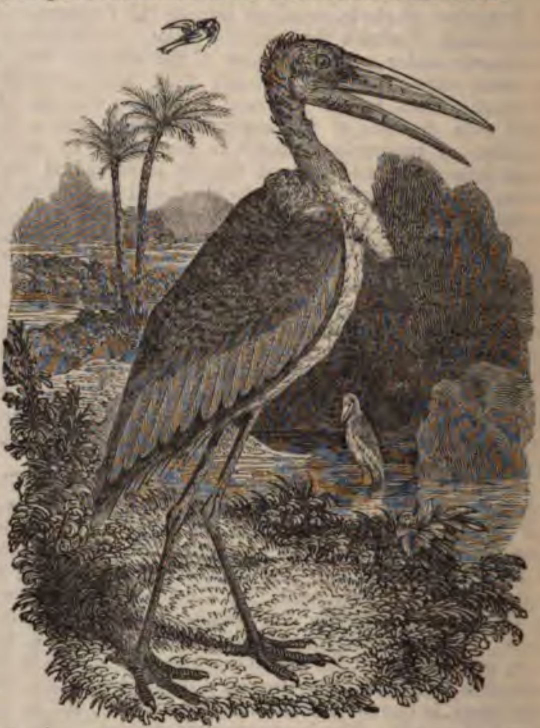
ADJUTANT-GENERAL, a staff-officer, one of those next in rank to the commander-in-chief. He is to the army what the adjutant is to a regiment; he superintends the details of all the dispositions ordered by the commander-in-chief, communicates general orders to the different brigades, and receives and registers the reports of the state of each, as to numbers, discipline, equipments, &c. Though in a large army, the adjutant-general is usually a general officer, yet this rank is not necessary; and in smaller detachments acting independently, the duties are frequently entrusted to an officer of lower rank.

ADJUTANT-GENERAL. Among the Jesuits, this title was given to certain fathers who resided with the general of the order. It was their duty to furnish him with information as to what was going on in the different countries of Europe, which was effected by means of emissaries employed for that purpose. Each country had one of these officers attached to it.

ADJUTANT, or GIGANTIC CRANE, (*Ciconia argala*, TEMMINCK, *Mycteria argala*, VIEILLOT.) A singular bird, not uncommon in travelling menageries, being easily tamed, and hardy, though a native of the warmer parts of India and found near Calcutta. Its size may be inferred from the fact of its wings, from tip to tip, measuring about fourteen or fifteen feet when stretched out; from the tip of the bill to the extremity of the claws it is seven feet and a half, while it is five feet high when standing erect. Its upper parts are ash-grey, the feathers there being stiff and hard; the under parts are white, and there the plumes are long; the head and neck are without feathers, but the red callous skin there is furnished with hairs; a long slightly downy conical bag or pouch, like 'a large sausage,' (to use the comparison of Baron Cuvier) hangs from the middle of the neck. The beak is very large, thick at the base, and the gape is very wide.

Though this does not rank in systematic classifications as a bird of prey, being properly placed with wading birds (*Grallatores*, ILLIGER), it is one of the most voracious and carnivorous birds known. The structure of its digestive organs corresponds with this voracious habit; though what comparative anatomists term the solvent or gastric glands are differently formed from those of any other bird. Their usual position in other birds is round the upper portion of the stomach; but in the adjutant they form two circular figures, about an inch and a half in diameter on the fore and back part of it, each gland being composed of five or six cells, and these opening into one common pipe (*ductus*). The gizzard and digastric muscle are nearly of the same strength with those of the crow, the gizzard being lined with a similar horny membrane.

The adjutant is not only capable of digesting bones, but it seems to be fond of them, swallowing every bone which it can get down its gullet,—a circumstance which has led to its being called the *bone-eater*, or *bone-taker*. It has been stated by Sir Everard Home, that there was found in the craw or stomach of a gigantic crane a land tortoise ten inches long, and a large male black cat entire. [*Ives' Voyage*, p. 184. *Phil. Trans.* 1813, p. 77.] Its great voracity, however, is extremely useful in the countries which it inhabits, as it collects vermin from every quarter, such as snakes, lizards, frogs, and other reptiles, devouring such immense numbers of these as to prevent them from annoying the inhabitants, who, on that account, hold the bird in as great estimation as the Hollanders do the stork.



[Adjutant, Ardea Gigantea. From a specimen in the Zoological Gardens.]

Mr. Smeathman furnished Dr. Latham with an interesting account of the adjutants from personal observations in India. 'They are,' says Dr L., 'met in companies; and when seen at a distance, near the mouths of rivers, coming towards an observer, which they often do with their wings extended, may well be taken for canoes upon the surface of a smooth sea—when on the sand-banks, for men and women picking up shell-fish or other things on the beach. One of these, a young bird about five feet high, was brought up tame, and presented to the chief of the Bananas, where Mr. Smeathman lived; and, being accustomed to be fed in the great hall, soon became familiar, duly attending that place at dinner-time, placing itself behind its master's chair frequently before the guests entered. The servants were obliged to watch narrowly and to defend the provisions with switches; but, notwithstanding, it would frequently seize something or other, and once purloined a whole boiled fowl, which it swallowed in an instant. Its courage is not equal to its voracity, for a child of eight or ten years old soon puts it to flight with a switch, though at first it seems to stand on its defence, by threatening with its enormous bill widely extended, and roaring with a loud voice like a bear or tiger. It is an enemy to small quadrupeds, as well as birds and reptiles, and slily destroys fowls or chickens, though it dares not attack a hen openly with her young. Every thing is swallowed whole; and so accommodating is its throat, that not only an animal as big as a cat is gulped down, but a shin of beef broken asunder serves it but for two morsels. It is known to swallow a leg of mutton of five or six pounds, a hare, a small fox, &c. After a time the bones are rejected from the stomach, which seems to be voluntary, for it has been known that an ounce or two of emetic tartar given to one of these birds produced no effect.’ [*Gen. Hist. of Birds*, ix. 40, 41.]

Lord Valentia (now Lord Mountnorris), after mentioning the amazing flocks of kites and crows which abound on the house tops and in the gardens at Calcutta, and subsist on the remains of the great profusion of food there dressed, which the prejudices of the natives forbid them to touch, adds, that in the office of scavengers the kites and crows are assisted during the day by the adjutant bird, and at night by the foxes, jackals, and hyænas from the jungles in the vicinity. [*Trav.* i. 519.]

Ives calls the bird a monster; but says the natives reverence it so much that they were rejoiced when he was unsuccessful in shooting one. They believe, according to the strange doctrine of transmigration, that the souls of the Brahms possess the birds, and render them invulnerable. [*Ives' Voyage*, London, 1773, p. 183.]

ADMINISTRATION and ADMINISTRATOR. An administrator is a person appointed by the ordinary or bishop of the diocose to make administration of, or to distribute the goods of a person who dies without having made a will. It is said that, in very early times, the king was entitled in such a case to seize upon the goods in his character of general trustee of the kingdom, in order that they might be applied to the burial of the deceased, the payment of his debts, and to making a provision for his family. It would appear that this power of the crown over the effects of intestates was greatly abused, for, by Magna Charta, King John granted that ‘if a freeman should die intestate, his chattels should be distributed by the hands of his near relations and friends, under the inspection of the church.’ This, probably, formed the foundation upon which the prelates afterwards built their right to administer by their own hands the goods of an intestate. There is, at all events, no doubt of the fact, that the power of seizing the goods of an intestate was, at a later period, transferred from the crown to the bishops. The whole property was, in the first instance, placed in the custody of the ordinary, or bishop of the diocese in which the intestate died; and after the deduction of what were technically called ‘*partes rationabiles*,’ that is, two-thirds of the whole, which the law gave to the widow and children, the remaining third part vested in the bishop upon trust to distribute that proportion in charity to the poor, or in what were then termed ‘pious uses,’ for the benefit of the soul of the deceased. This trust was greatly abused by the prelates, who unscrupulously converted the whole residue of the property to the use of their order, without even paying the just debts of the deceased. To remedy this injustice, the statute called ‘the Statute of Westminster the Second,’ which was passed in the reign of Edward I., provided that the debts of the deceased should be paid by the ordinary in the same manner as if he had been an executor appointed by a will. The remainder, after payment of debts, still continued applicable to the same uses as before. To prevent the abuses of the power thus retained by the ordinary, and to take the administration entirely out of his hands, the legislature again interposed, and by the statute of 31st Edward III., cap. 2, the ordinary was directed, in case of intestacy, to depute ‘the nearest and most lawful friends’ of the deceased to administer his goods; and these *administrators* are put upon the same footing with regard to suits and to accounting, as executors appointed by will. This is the origin of administrators; they are merely the officers of the ordinary, appointed by him in pursuance of the statute, which selects the nearest and most lawful friend of the deceased; these words being interpreted to denote the nearest relation by blood who is not under any legal disability. The subsequent statute of 21st Henry VIII., c. 5, enlarges a little more the power of the ecclesiastical judge, and permits him to grant administration *either* to the *widow*, or the next of kin, or to both of them; and, where several persons are equally near of kin, empowers him to select one of them at his discretion.

If none of the kindred are willing to take out administration, a creditor is permitted to do so; and in the absence of *any* person entitled to demand letters of administration, the ordinary may appoint whomsoever he may think proper, to collect the goods of the deceased, for the benefit of such as may by law be entitled to them.

Administrators may be nominated even in a case where a will has been made, if by the will no executors are appointed, or if the persons named refuse, or if they are not legally qualified to act; and in any of these cases the administrator only differs from an executor in the name of his office and mode of his appointment. In practice, when the executor *refuses* to act, it is usual to grant administration to the residuary legatee, *i. e.* to the person to whom, by the will, the remainder of the property, after payment of debts and legacies, is given.

In the case of a complete intestacy, it was formerly much doubted whether an administrator, when appointed by virtue of 31st Edward III., could be compelled to make any distribution of the effects of the intestate which remained in his hands after payment of debts; for though the administration had been transferred from the ordinary to the next of kin of the deceased, the latter stood in much the same position as the former had occupied, and was consequently not legally bound to administer. The spiritual courts endeavoured to enforce distribution by taking bonds from the administrator for that purpose, but these bonds were declared void by the common law courts. These controversies are now at an end, for the statute, commonly called the ‘Statute of Distributions,’ 22 and 23 Charles II., cap. 10, explained by 29 Car. II., cap. 30, enacts that the surplus effects, after payment of debts, shall, after the expiration of one year from the death of the intestate, be distributed in the following manner;—one-third shall go to the widow, and the remainder in equal proportions to the children of the intestate, or, if dead, to their legal representatives, *i. e.* their lineal descendants: or, if there be no children, or children's legal representatives, then one moiety shall go to the widow, and the other moiety to the next of kindred in equal degrees of relationship, or to their representatives: if no widow, the whole shall go to the children or their representatives in equal portions: if neither widow nor children, the whole shall be distributed amongst the next of kin or their representatives.

By the same statute, it is directed that no child of the intestate (except it be his heir at law) on whom he settled in his lifetime any estate in lands or pecuniary portion, equal to the distributive share of the other children, shall have any part of the surplus to be administered; but if the estates thus given him by way of advancement are not equivalent to the other shares, the child so advanced shall have enough to put him on an equality with his brothers and sisters. This is a very reasonable provision; for in the absence of all expression of the father's intention by will, it may be presumed that he had no intention of giving more to one child than to another, unless it be his heir; and as he had advanced to one child his portion, it would not be fair for that child, at the death of his father without leaving a will, to obtain a share of the property equal to that obtained by the other children who had received no advances in their father's lifetime.

The statute of distributions expressly excepts and reserves the customs of the city of London, of the province of York, and of all other places having peculiar customs of distributing intestates' effects. These customs resemble, in some degree, the provisions of the statute, though they differ from them in some respects.

For further information upon the subject of administrator and administration, which will comprise all necessary practical directions, see EXECUTORS.

ADMIRAL, the title of the highest class of naval officers. Various fanciful etymologies of the word have been given; but there can be no doubt that it is merely a corruption of the Arabic *Amir* or *Emir*, a lord or chieftain. The *al* is nothing more than the Arabic definite article *al*, *the*, without the noun to which it belongs. Eutychius, Patriarch of Alexandria, writing in the tenth century, calls the Caliph Omar *Amirol Mumenim*, which he translates into Latin *Imperator Fidelium* (the Commander of the Faithful). To form the word Admiral, the two first terms of some title similar to this have been adopted, and the third has been dropt. From this it appears that the word ought properly to be written, or rather ought at first to have been written, Amiral, or Ammiral, as we find it in Milton's expression:—

> 'The mast
> Of some great Ammiral.'

Milton, holding to this principle of orthography, wrote in Latin *Ammiralatûs Curia* (the Court of Admiralty). The French say *Amiral*, and the Italians *Ammiraglio*. The *d* seems to have got into the English word from a notion that Admiral was an abridgment of *Admirable*. The Latin writers of the middle ages sometimes, apparently from this conceit, style the commander of a fleet *Admirabilis*, and also *Admiratus*. The Spaniards say *Admirante* or *Almirante*.

Under the Greek empire, the term *Emir* or *Amir* (in Greek characters Αμηρ) was used most commonly to designate the governor of a province or district, which was itself called Αμηραδιας. Gibbon states that the emir of the fleet was the third in rank of the officers of state presiding over the navy; the first being entitled the *Great Duke*, and the second the *Great Drungaire*. [*Decline and Fall*, chap. liii.] The holy wars of the twelfth and thirteenth centuries seem to have first introduced the term Admiral into Europe. The Admiral of Sicily is reckoned among the great officers of state in that kingdom in the twelfth century; and the Genoese had also their admiral very soon after this time. In France and England the title appears to have been unknown till the latter part of the thirteenth century; the year 1284 being commonly assigned as the date of the appointment of the first French admiral, and the *Amiral de la Mer du Roy d'Angleterre* being first mentioned in records of the year 1297. The person to whom the title is given in this instance is named William de Leybourne. Yet at this time England, although she had an admiral, had, properly speaking, no fleet; the custom being for the king, when he engaged in a naval expedition, to press into his service the merchant-vessels from all ports of the kingdom, just as it is still the prerogative of the crown to seize the men serving on board such vessels. This circumstance is especially deserving of notice, as illustrating what an admiral originally was. The King of England's admiral of the sea was not necessarily the actual commander of the fleet; he was rather the great officer of state, who presided generally over maritime affairs. Sometimes he was not a professional person at all; at other times he was one of the king's sons, or other near kinsman yet in his nonage, on whom the office was bestowed, as being one of great dignity and emolument; its duties were performed by persons who acted in his name. But these duties were usually, not to command ships in battle, but merely to superintend and direct the naval strength of the kingdom, and to administer justice in all causes arising on the seas. The former of these duties is now executed by the department of government called the *Admiralty*, and the latter by the legal tribunal called the *High Court of Admiralty*.

Anciently, two or more admirals used often to be appointed to exercise their powers along different parts of the coast. Thus, in 1326, mention is made of the Admiral of the King's Fleet, from the mouth of the Thames northward, and of another officer with the same title, commanding from the mouth of the Thames westward. Besides these, there were also Admirals of the Cinque Ports. It is the opinion of some writers that the first admiral of all England was appointed in the year 1387. Even the officer bearing this title, however, was not then the person possessing the highest maritime jurisdiction. Above him there was the King's Lieutenant on the Sea (*Locum tenens super Mare.*) Also before the term Admiral was used at all, there was an officer designated the *Custos Maris*, or Guardian of the Sea.

From the year 1405 (the 6th of Henry IV.) there is an uninterrupted series of Lord High Admirals of England, the office being always held by an individual, till the 20th November, 1632, when it was for the first time put in commission. All the great officers of state were the commissioners. During the Commonwealth, the affairs of the navy were managed by a Committee of Parliament, till Cromwell took the direction of them himself. On the Restoration, the king's brother, the Duke of York, was appointed Lord High Admiral; and he retained the place till the 22d of May, 1684, when Charles took it into his own hands. On the duke's accession to the throne, in the beginning of the following year, he declared himself Lord High Admiral. On the Revolution, the office was again put in commission; and it continued to be held in this form till 1707, when Prince George of Denmark was appointed Lord High Admiral, with a council of four persons to assist him. On his death in November, 1708, the Earl of Pembroke was appointed his successor, with a similar council. The earl resigned the office in 1709, since which time, till now, it has always been in commission, with the exception of the period of about sixteen months, (from May, 1827, till September, 1828,) during which it was held by the present king, then Duke of Clarence. The commissioners, styled the Lords Commissioners of the Admiralty, were formerly seven, and are now six in number; and the First Lord is always a member of the cabinet. It is the First Lord, indeed, who principally exercises the powers of the office.

Till the reign of Queen Anne, the salary of the Lord High Admiral was only 300 marks, the emoluments of the place, which were very large, arising chiefly from perquisites, or droits, as they were called, of various descriptions. Prince George of Denmark resigned all these droits into the hands of the crown, receiving in their stead a salary of 7000*l.* a year. The salary of the First Lord of the Admiralty is at present 4,500*l.* per ann., and that of each of the others 1000*l.*

The title of admiral is also given in modern times to naval officers of the highest rank; of which we have in England three classes, namely, Admirals of the Red, of the White, and of the Blue. Admirals of the Red bear their flag at the main-top-gallant-mast-head; those of the White, at the fore-top-gallant-mast-head; and those of the Blue, at the mizen-top-gallant-mast-head. After the union with Scotland in 1707, the use of the red flag was discontinued, the union jack being substituted for it; but it was resumed at the naval promotion which took place in 1805, after the battle of Trafalgar. There are also vice-admirals and rear-admirals of each flag, the former ranking with lieutenant-generals, and the latter with major-generals in the army. A full admiral ranks with a general, and an admiral who is actually the commander-in-chief of a fleet with a field-marshal. The title of Admiral of the Fleet is merely an honorary distinction. There are also a vice-admiral and a rear-admiral of the United Kingdom, which places are now sinecures, and are usually bestowed upon naval officers of high standing and eminent services. According to the official Navy List for January, 1833, there were, in addition to the admiral of the fleet, who receives sea-pay of 6*l.* per day, forty-eight admirals, with the pay of 5*l.* per day; fifty-eight vice-admirals, with the pay of 4*l.* per day; and sixty-four rear-admirals, with the pay of 3*l.* per day. In addition to this pay, every commander-in-chief receives a further sum of 3*l.* per day while his flag shall be flying within the limits of his station.

ADMIRALTY COURTS, in Law, are courts having jurisdiction over maritime causes, whether of a civil or criminal nature. In England, the Court of Admiralty is held before the Lord High Admiral or his deputy, who is called the judge of the court: when there was a Lord High Admiral, the judge of the Admiralty usually held his place by patent from him; but when the office of admiral is executed by commissioners, he holds his place by direct commission from the crown under the great seal.

The Court of Admiralty is twofold: the Instance Court and the Prize Court; the commissions to hold these courts are perfectly distinct, but are usually given to the same person. Neither of them is a COURT of RECORD.

The civil jurisdiction of the *Instance Court* extends generally to marine contracts; that is, to such contracts as are made upon the sea, and are founded in maritime service or consideration,—as where the vessel is pledged during the voyage for necessary repairs; and to some few others, which, though entered into on land, are executed entirely upon the sea,—such as agreements for mariners' wages. But if part of a cause of action arises on the sea and part upon the land, the courts of common law exclude the Admiralty Court from its jurisdiction; and even in contracts made abroad they exercise in most cases a concurrent jurisdiction. The Admiralty Court has no cognizance of contracts under seal, except where, from the nature of the subject matter, it has exclusive jurisdiction; as in the case of an hypothecation bond, under which a ship is given in pledge for necessaries furnished to the master and mariners: this security, as it only binds the vessel on which the money is advanced, and imposes no personal contract on the borrower, does not fall within the cognizance of the common law. The Instance Court likewise regulates many other points of maritime right, such as disputes between part-owners of vessels, and questions relating to salvage, that is, the allowance made to those who have saved or recovered ships or goods from dangers of the sea. It has also power to inquire into certain wrongs or injuries committed on the high seas, such as collision, or the running foul of one ship against another, and in such cases to assess the damages to be paid to the party injured.

This court is usually held at Doctors'-Commons, like the ecclesiastical courts, to which, in its general constitution, it bears a great resemblance. The law by which its proceedings are governed is composed of such parts of the civil law as treat of maritime affairs, together with the laws of Oleron and other maritime laws, with such corrections, alterations, or amendments as have been introduced by acts of parliament or common usage. [*Blackstone's Commentaries*, vol. iii. pp. 68, 106.]

In criminal matters the Court of Admiralty has, partly by common law, partly by a variety of statutes, cognizance of piracy and all other indictable offences committed either upon the sea or on the coasts, when beyond the limits of any English county; and this (at least since the time of Edward III.) to the exclusion of the jurisdiction of courts of common law. With respect to certain felonies, committed in the main stream of great rivers below the bridges, the common law and the Admiralty have a concurrent jurisdiction.

The mode of proceeding in the Admiralty courts in criminal trials, like that in all other suits there, was anciently according to the course of the civil and marine laws; until, in the reign of Henry VIII., a statute was passed which enacted that these offences should be tried by commissioners of oyer and terminer under the king's great seal, and that the proceedings should be according to the law of the land. In pursuance of this and some later statutes, sessions of oyer and terminer and gaol delivery, called the Admiralty Sessions, are held twice a year, namely in March and October, at the Old Bailey. The acting commissioners are the judge of the Admiralty, (who, in point of form, is the presiding judge,) together with two common-law judges, and one or two civilians. [Blackstone's *Commentaries*, vol. iv. p. 268. Hale's *Pleas of the Crown*, vol. ii. p. 16.] By several recent statutes it is declared that offences committed within the jurisdiction of the Court of Admiralty shall be liable to the same punishment as if committed on land.

The Prize-Court is the only tribunal for deciding what is, and what is not, lawful prize, and for adjudicating upon all matters civil and criminal relating to prize. By '*prize*,' is to be understood every acquisition made *jure belli* (by right of war) which is either itself of a maritime character, or is made, whether at sea or by land, by a naval force. All acquisitions by right of war are by the law of war vested in the sovereign, but are usually, by the municipal regulations of each particular state, (as in England by several acts of parliament,) distributed in certain proportions among the persons who took or assisted in taking them. But the property in the thing captured is held by English jurists, agreeably to the general practice of the law of nations, not to be absolutely taken from the original owners, until, by the sentence of a properly authorized court, it has been condemned as lawful prize. We have, as it should appear, no court authorized to adjudicate on property captured by land-forces, or *booty*, as it is commonly termed by writers on the law of nations; but, when occasion requires, (as, for instance, of late years, when property to an immense amount was captured by the British army in the conquest of the Deccan,) commissioners are specially appointed for the purpose. But property captured by the naval force forms the peculiar province of the Prize-Court of the Admiralty. "The end of a Prize-Court," says Lord Mansfield, "is to suspend the property till condemnation; to punish every sort of misbehaviour in the captors; to restore instantly, if upon the most summary examination there does not appear sufficient ground; to condemn finally, if the goods really are prize, against every body, giving every body a fair opportunity of being heard." [See Douglas's *Reports*, p. 572, &c.]

Every sovereign power has a right to erect Admiralty Courts for the trial of prizes taken by virtue of the commissions which it has granted; but has no power to reverse the sentences given by the tribunals of another state: the only regular method of rectifying their errors is by appeal to the superior court.

The Cinque Ports have an exclusive Admiralty jurisdiction of their own: in Ireland, there has been an Instance Court from time immemorial; and there is an Admiralty Court in Scotland with very extensive civil jurisdiction. In several of our colonies there are courts of Vice-Admiralty, which not only have authority both as Instance Courts and Prize Courts, but have also, in certain revenue cases, concurrent jurisdiction with the colonial courts of record. [Stokes, *On the Colonies*, p. 357.] From the Vice-Admiralty Courts of the colonies an appeal lies, in instance causes, to the Court of Admiralty in England; and from the Court of Admiralty in England an appeal lies, in instance causes, (whether originating in that court or coming before it by appeal) to the king in council. See statute 2 and 3 Will. IV. c. 92. From prize causes, whether in the Vice-Admiralty Courts, or in the Court of Admiralty in England, the appeal lies directly to certain commissioners of appeal in prize causes, who are appointed by the king under the great seal, and are usually members of his privy council, and whose appointment is generally regulated or recognized by treaties with foreign nations.

For the law on the whole of this subject, see Dr. Browne's *View of the Civil Law*, and the *Law of the Admiralty*, and Comyn's *Digest*, tit. *Admiralty*.

ADMIRALTY ISLANDS. A group of islands, consisting of one larger and about 40 smaller, which are generally classed in the division of Australia. They lie south of the equator between the second and third degree of latitude, and between 146° 18′, and 147° 46′ E. long.; and were discovered by the Dutch in 1616. Captain Carteret visited them in 1767, and the Spanish navigator Morello in 1781. d'Entrecasteaux, who was despatched to see if any trace of La Perouse's crew could be found, visited these islands in 1793. The soil and climate are said to be good, but the landing is rendered difficult by reason of reefs and breakers. A number of small islands and reefs form a cordon round the large one, which is difficult of approach, and no landing was made on it by d'Entrecasteaux. Only those islands seemed to be inhabited which had cocoa-nut trees on them. As they are very little elevated above the level of the sea, water must necessarily be scarce. The largest island is about 45 miles long, and like most of them, principally covered with cocoa-nut trees; the inhabitants are of a dark colour with frizzled hair, and they go naked. They are described as good looking and well made. To the French navigator they seemed a tolerably well-disposed people, though Carteret's account of them is unfavourable. They point their lances with a species of hard stone. When the French visited the island, the people showed the greatest eagerness to possess iron, which it is conjectured they first obtained from the Spaniards. [See *d'Entrecasteaux's Voyage*, Paris, 1808, 2 vols. 4to.]

ADMIRALTY ISLAND, on the N.W. coast of North America, in the Archipelago of George III., and within that part of the continent which, since the treaty of 1825, belongs to what we call Russian America. Admiralty Island is about 80 miles long, and, in some parts, 20 wide: it lies between 57° 2′, and 58° 24′ N. lat., and 134° 52′, and 135° 30′ W. long. The island was completely circumnavigated by Vancouver, who considers it to be about 60 leagues in circuit. With the exception particularly of the S.E. coast, the shores are bold, and afford many convenient bays with fine streams of fresh water running into them. The island is moderately elevated and rocky, but covered with forests, especially pine. The natives of the island carry on some little trade with Europeans. [See *Vancouver's Voyage*, vol. iii. p. 277.]

ADO'NIS, a river of ancient Syria, which rises in the mountains of Lebanon. It has the same name with a personage of considerable importance in Pagan mythology, of whose story the following is a brief sketch:—'Adonis, son of Myrrha, daughter of Cinyras, King of Cyprus, was born in Arabia, whither his mother had fled in consequence of certain transactions which it is not necessary to relate. Before the birth of her son she was transformed into the tree which produces the fragrant gum called by her name; this, however, did not hinder his being brought into the world in due season: he grew up a model of manly beauty, and was passionately beloved by Aphrodite (Venus), who quitted Olympus to dwell with him. Hunting was his favorite pursuit, until, having gone to the chase against the entreaties of his mistress, he was mortally wounded in the thigh by a wild boar. After death he was said to stand as high in the favour of Persephone (Proserpine), as before in that of Aphrodite; but the latter being inconsolable, her rival generously consented that Adonis should spend half the year with his celestial, half with his infernal mistress. The fable has been variously interpreted. One explanation makes the alternate abode of Adonis above and under the earth, typical of the burial of seed, which in due season rises above ground for the propagation of its species; another, of the annual passage of the sun from the northern to the southern hemisphere.—In the time of Pausanias, in the second century of our æra, there existed an ancient temple of Adonis and Aphrodite, at Amathus, in Cyprus.

The story of Adonis appears to have been introduced into Greece from Syria. According to Pausanias, Sappho sung of Adonis; and his name, with allusion to his rites, occurs in a fragment of Alcæus. But it is by the Greek poets of later date, and their Latin imitators, Theocritus, Bion, Ovid, that his story has been probably expanded, and invested with the elegance which is the peculiar character of Grecian mythology. The Adonia are mentioned by Aristophanes among the Athenian festivals, and this is (we believe) the earliest mention of them, except some notice in the poems attributed to Orpheus, (the epoch of which is, however, too doubtful to be received as authority,) and the songs attributed to Sappho and Alcæus. The rites began with mourning for the death of Adonis—(thus Ezekiel, viii. 13, 'He brought me to the door of the Lord's house . . . . and behold, there sat women weeping for Thammuz'); then changed into rejoicing for his return to life and to Aphrodite; and concluded with a procession, in which the images of Adonis and Aphrodite were carried, with rich offerings, in separate couches; after which the former appears to have been thrown into the sea. See Theocr. Idyll. xv. In the time of Pausanias, the women of Argos, in the Peloponnesus, lamented Adonis.

In Syria we know the worship of Adonis (if, according to the received notion, he be the same personage as Thammuz) to be probably of much older date. We know, from the passage in Ezekiel already quoted, that the adoration of the latter was one of the abominations of Judah six centuries before Christ. Whatever resemblance there may have been between the early Syrian and Grecian rites, the former were far more deeply polluted by the atrocities of a brutish superstition, to which the natives of Syria were unusually prone. Byblos, a town near the river Adonis, was one of the chief seats of this worship, which was intimately connected with a peculiarity incident to the river. Its waters, at a certain period of the year, assume a deep red, and were said to be discoloured by the blood of Adonis.

> ....'Thammuz came next behind,
> Whose annual wound in Lebanon allured
> The Syrian damsels to lament his fate
> In amorous ditties all a summer's day,
> While smooth Adonis, from his native rock,
> Ran purple to the sea, supposed with blood
> Of Thammuz, yearly wounded.'
>
> *Paradise Lost*, i. 446.

The phenomenon has been observed by modern travellers, and is attributed to the rains, which bring a quantity of red earth into the stream. [See Maundrell's *Travels.*] This, which probably is the true solution, was suggested even in the time of Lucian.—[*De Dea Syria*, § 8.]

ADO'NIS, in Botany, is a genus of plants belonging to the natural order ranunculaceæ, and containing many species of very great beauty. The name is merely poetical. Adonis is distinguished from ranunculus by the want of a little scale at the base of the petals, and from other genera of the order by the numerous hard, dry, sharp-pointed grains of which its fruit consists.

Botanists divide the genus into two sections, the first of which comprehends all the annual kinds, the second all the perennials. Ten species are spoken of as belonging to the first section, inhabiting corn-fields and similar dry exposed places, chiefly in the south of Europe and north of Africa. Some of them have deep crimson flowers, as *A. autumnalis*, the common pheasant's-eye of our gardens; in others the blossoms are yellow; it is not improbable that they are all varieties of the same species.

Of the perennial kinds, *A. vernalis*, which is common in gardens in England, is found in a wild state abundantly on all the mountains of middle Europe. Its flowers have from ten to twelve petals of a yellow colour, and of a brilliancy which is rendered the more dazzling by the deep green tuft of finely divided leaves among which they expand. It is only a few inches high, and is one of the early harbingers of spring. Three others are described, all mountain plants, resembling *A. vernalis* in general appearance, but perhaps still more beautiful. They seem to have been occasionally brought to this country, but to have been soon lost again.

Nothing has been remarked as to the sensible properties of these plants; they doubtless partake of the acridity so prevalent in their tribe.

ADOPTION, (from *adoptare*, Latin,) means taking by choice. By the Roman law if a person had no children of his own he might appoint any other person's, whether related to him or not, to be his children *by adoption*. In order to understand the ordinary mode of adoption and its legal effects, it will be necessary to remember that at Rome the relation of father and son was but little different from that of master and slave, either in the rights and duties attached to it, or in the manner in which it was dissolved. Hence, if a person wished to adopt the son of another, the natural father sold the boy to him by a regular sale before a magistrate, and, in order that he might be so completely emancipated from his father's authority, as never to be liable to fall under it again, it was requisite that this sale should be formally repeated three several times. (See EMANCIPATION.) The father thus conveyed away all his paternal rights, and the child, from that moment, became, to all intents and purposes, a member of the family of his adopter. If the person to be adopted was his own master, the mode of proceeding was by a bill (analogous to our private acts of parliament), proposed to the people in the comitia curiata. This was called ARROGATION, from *rogare*, to propose a bill. In either case the adopted child became subject to the authority of his new father; passed into his family, name, and sacred rites, and succeeded to his property. Clodius, the enemy of Cicero, passed, by this ceremony of a bill, from the patrician to the plebeian rank, in order to qualify him to be tribune. [Cic. *Att.* ii. 7. Suet. *Aug.* 20.]

The history of Rome abounds with instances of adoption. Thus one of the sons of Paulus Æmilius, the conqueror of Macedonia, was adopted by the son of Scipio Africanus the Elder, and thus acquired the name of *Publius Cornelius Scipio;* he was also called *Æmilianus*, to point out the family of his birth; and when he had destroyed Carthage in the third Punic War, he received, like his adoptive grandfather, the appellation of *Africanus*, and is usually spoken of in history as Scipio Africanus the Younger.

Under the emperors the mode of adoption became the subject of legal reform; and that which for so many ages could be effected only by a circuitous course of arbitrary forms, founded upon legal fictions, was allowed to be done by a short and simple process before a magistrate.

There was also a custom in ancient Rome of adopting children by will: thus it was that Julius Cæsar adopted his great nephew Octavius, who was thenceforth called Caius Julius Cæsar Octavianus; but is most generally known under the more pompous appellation of AUGUSTUS, which he afterwards assumed.—[Heineccius, *Antiquitates Romanæ*, lib. i., tit. xi.] In like manner, several of the Roman emperors adopted their successors; for instance, Augustus adopted his step-sons, Tiberius, Nero, and Claudius Drusus, the former of whom afterwards succeeded to the empire. [Tacit. *Ann.* i. 3. Suet. *Aug.* 101.] So also Tiberius, by the order, and during the life-time of Augustus, adopted his nephew Germanicus, who died in the lifetime of Tiberius; and on the death of Tiberius, Caligula, the son of Germanicus, became emperor. At a subsequent period, the emperor Claudius went so far as to adopt his step-son Domitius, afterwards the emperor Nero, to the exclusion of his own son Britannicus. Tacitus remarks, that Nero was the first stranger in blood ever adopted into the Claudian family.—[Tacit. *Annal.* xii. 25.] At various periods of the Roman history, great inconvenience was experienced in consequence of the general disinclination to marriage among the citizens. Before the times of the emperors, it is clear that, in order to remove this inconvenience, rewards were held out for the encouragement of marriage, and penalties imposed upon celibacy. Immunities and exemptions from state burthens were also given to those who possessed many children; and in order to obtain these, the adoption of children became a great abuse. Aulus Gellius complains of the mischievous custom prevalent in his time, that 'an adoptive son should entitle his adoptive father to privileges in the state.'—[Aul. Gel. *Noct. Att.* v. 19.] Under Julius Cæsar, after the wars, laws for the encouragement of population were proposed, but not carried into effect: but in the time of Augustus, the Julian law was proposed, A.U.C. 736, which contained heavy penalties upon celibacy, and proportionate rewards for the possession of children. This law was so extremely unpopular, that, Suetonius says, it could not be executed, on account of the tumultuous opposition raised to it.—[Sueton. *Aug*. 34.] Afterwards, however, a law passed, called from the Consuls who introduced it, 'Lex Papia Poppæa;' by which many privileges were given to those who possessed children; and amongst others, it was declared that, of candidates for prætorships and other offices, those should have the preference who had the greatest number of children. This occasioned an intolerable abuse in the adoption of children. Tacitus says, that in the time of Nero, a 'pestilent abuse was practised by childless men; who, whenever the election of magistrates or the allotment of provinces was at hand, provided themselves with sons by fraudulent adoptions; and then when, in common with real fathers, they had obtained prætorships and provincial governments, they instantly released themselves from their adopted sons. Hence the genuine fathers betook themselves with mighty indignation to the senate,' and petitioned for relief. This produced a decree that in the pursuit of any public employment whatever, no feigned adoptions should be of any avail, nor in taking estate by will.—[See Tacit. *Annal.* xv. 19.]

The eleventh title of the first book of Justinian's *Institutes* is concerning Adoption. By this law it is declared that there are two kinds of adoption, one called *arrogatio*, when by a rescript of the emperor, (*principali rescripto*,) a person adopts another who is independent of parents; the other, when by the authority of the magistrate (*imperio magistratûs*), he who is under the control of his parent is made over by that parent to another person, and adopted by him either as his son, his grandson, or a relation in any inferior degree. Females also might be adopted in the same manner. But when a man gave his child to be adopted by a stranger, none of the parental authority passed from the natural to the adoptive father; the only effect was, that the child succeeded to the inheritance of the latter if he died intestate. It was only when the adopter was the child's paternal or maternal grandfather, or otherwise so related to him as that the right of nature concurred with that of adoption, that the new connection became, in all respects, the same with the original one. It was also ordained that the adopter should in all cases be at least eighteen years older than the person he adopted. Women, according to the Justinian code, were not legally entitled to adopt; but after having lost children of their own by death, they might by the indulgence of the emperor be permitted to receive those of others in their place. A slave, on being named a son by his master before a magistrate, became free, but acquired no filial right.

The German system of adoption is derived from the Roman law, though it cannot be said, according to the proper meaning of the word, to have been in force before the fifteenth or sixteenth century. Any adoption, in order to be strictly and properly a *legal* process, must take place before a court, or be confirmed by the proper authorities. The adopted son retains his family name, and prefixes or adds to it that of his adoptive father; but in case a nobleman adopts a commoner, the son does not succeed to the rank, unless it is confirmed by the sovereign. The more modern German institutes still keep to the *principles* of the Roman system of adoption, though the whole is modified so as to be more in harmony with German usages. The Prussian law does away with all distinction between *adoption* and *arrogation;* and allows the adopted son who is of age to manage his *own* property. The Austrian law does the same. Both also agree in requiring the age of the adoptive father to be fifty at least. The Prussian law, with respect to the adopted son, merely requires him to be younger than the father; while the Austrian code requires him to be eighteen years younger than the adoptive father. [Ersch and Gruber's *Encyclopädie*, Art. *Adoption*.]

The French law of adoption is to be found in the eighth title of the first book of the *Code Civil*. The following are its principal provisions. Adoption is only permitted to persons above the age of fifty, having neither children nor other legitimate descendants, and being at least fifteen years older than the individual adopted. It can only be exercised in favour of one who has been an object of the adopter's constant care for at least six years during minority, or of one who has saved the life of the adopter in battle, from fire, or from drowning. In the latter cases, the only restriction respecting the age of the parties is, that the adopter shall be older than the adopted, and shall have attained his majority, or his twenty-first year. In every case the party adopted must be of this age. The form is for the two parties to present themselves before the justice of the peace (*juge de paix*) for the place where the adopter resides, and in his presence to pass an act of mutual consent; after which the transaction, before being accounted valid, must be approved of by the tribunal of *first instance*, within whose jurisdiction the domicile of the adopter is. The adopted takes the name of the adopter in addition to his own; and no marriage can take place between the adopter and either the adopted or his descendants, or between two adopted children of the same individual, or between the adopted and any child who may be afterwards born to the adopter, or between the one party and the wife of the other. The adopted acquires no right of succession to the property of any relations of the adopter; but in regard to the property of the adopter himself, it is declared that he shall have precisely the same rights with a child born in wedlock, and that, even although there should be other children of the latter description born after his adoption.

Adoption is still practised both among the Turks and among other eastern nations. It is common for a rich Turk, who has no children of his own, to adopt as his heir the child of persons even of the poorest class. The bargain is ratified by the parties going together before the Cadi, and getting their mutual consent recorded; after which the child cannot be disinherited by his adoptive father. D'Herbelot states, that, according to the law of Mohammed, a person becomes the adopted son of another by undergoing the ceremony of passing through his shirt; whence the expression, to draw another through one's shirt, signifies to adopt him for a son. In India the same thing is said to be frequently done by the two parties merely exchanging girdles. In the Code of Gentoo Laws published by Mr. Halhed, the 9th section of the 21st chapter is entitled 'Of Adoption.' The law permits a child under five years of age to be given up for adoption by its father for a payment of gold or rice, if he have other sons, on the parties going before a magistrate and having a *jugg*, or sacrifice, performed. A woman, however, it is added, may not adopt a child without having her husband's consent; and there is even some doubt if she may with that. 'He,' concludes the law, 'who has no son, or grandson, or grandson's son, or brother's son, shall' (may?) 'adopt a son; and while he has one adopted son, he shall not adopt a second.'

ADOU'R, called by the Roman writers Atur, Aturis, and Aturus, a river in France, which rises in the department of Hautes Pyrenées (the Upper Pyrenees). Its course is first in a northerly direction, past the town of Bagnères de Bigorre (just above which there is a fall of one hundred feet); then towards the west, and finally towards the south-west, passing the towns of Tarbes, Aire, St. Sever (where it becomes navigable), Dax, and Bayonne, and describing in its whole course a semicircle, whose diameter, of about 100 miles, lies nearly N.N.W. and S.S.E. The whole length of the river is estimated by Maltebrun at 70 French leagues, or about 170 English miles. Its basin is bounded by the Pyrenees on the south, and on the east by a range of hills, extending from these mountains towards the sandy plains of the department of Gironde. Many streams from the Pyrenees, as the Gabas, Luy de France, Luy de Bearn, Gave de Pau, which receives the Gave d'Oléron and the Bidouze, fall into the Adour on the left bank; the Midouze, and others, on the right. The current is usually rapid, and the melting of the snows on the Pyrenees causes desolating inundations. The Adour falls into the Bay of Biscay, about three miles below the strong and flourishing town of Bayonne, having a bar at the mouth, upon which, at ebb tide, there is sometimes less than three feet water.

ADO'WA, one of the chief places in Abyssinia in the kingdom of Tigré, and in the district of Adowa, which is a part of Tigré proper (N. lat. 14° 12′ 30″, E. long. 39° 5′). It is partly on the side, and partly at the foot of a hill, an uncommon occurrence in Tigré, where most of the towns are on eminences. The houses are all of a conical form, and arranged pretty regularly in streets. The town is well supplied with water from those rivulets which fall into the Mareb, and grapes grow well in the gardens. Adowa from its position is the great mart between the coast and the interior provinces, and carries on a considerable trade, which is mostly in the hands of Mohammedan merchants. The population is probably not under eight thousand. Mr. Bruce informs us that the Jews have the sole privilege of thatching houses at Adowa, which, when rightly interpreted, may mean that they are the only persons who can do it well.

The chief manufactures of Adowa are coarse and fine cotton cloths, made both of native cotton from the low lands on the Tacazzé, and from cotton imported through Massowa on the coast of the Red Sea. Mr. Salt mentions the following as the chief imports which pass through Adowa for the Gondar market: a small quantity of lead, block tin, copper, and gold foil; small and cheap Persian carpets, raw silk from China, some velvets, French broad cloths, and coloured skins from Egypt; Venetian glass ware and beads, and such other small commodities as in various ways happen to be taken to Jidda, the port of Mecca. The commodities which mostly pass through the hands of the Adowa merchants for export, are ivory, gold, and slaves. A large part of the ivory comes from the province of Walkayt, which lies on the Tacazzé, and from the low lands north of Shiré, on the Mareb river, which abound in elephants. The gold is collected in the interior, but as to the amount that passes through Adowa, Mr. Salt is unable to state it with accuracy, owing to this branch of commerce being carried on with great secrecy. He computes the slaves exported at about a thousand annually. (Salt's *Abyssinia*, p. 424, &c.) Mr. Bruce says that the word 'Adowa' signifies 'pass or passage,' which therefore, we presume, he means to assert is the correct interpretation of 'Adowa' in the Tigré language. [See ABYSSINIA.]

ADO'XA *Moschatellina*, is a little inconspicuous plant found in woods and groves in all parts of Europe. It is common in Charlton and Hampstead woods, near London, and in many other spots in England.

From a granular root, which when dry is white as snow, arise, early every spring, a few leaves about four or five inches high, divided into three principal divisions, each of which is also three-leaved, with every lobe deeply cut into roundish segments. The stem that supports the flowers has two opposite leaves, like those of the root, only they have a short stalk, and consist of but three leaflets. The flowers have a musky smell, are pale green, and are collected in little round heads. Each one consists of a superior calyx of five lobes; there are no petals; the stamens are ten; the styles five; and the ovarium contains five cells. This last changes to a succulent berry, having five compressed seeds.

In English this is called moschatel; it is a pretty, interesting plant, much sought after by the curious for the sake of its delicate, modest appearance. No known properties belong to it: but it is remarkable as the only European plant which can be compared to the celebrated ginseng of the Chinese, that potent root, which is fabled to possess the power of even restoring youth to old age.

A'DRIA, formerly HADRIA or ATRIA, an ancient city, situated between the mouths of the Po and the Adige, first belonging to the Etrusci, afterwards a confederate city of the Romans, and a municipium. It was a sea-port town, carried on an extensive trade on the Adriatic, and was a station for the Roman fleet under the emperors. After the fall of the empire, the inundations of the Po and the Adige, in consequence of the neglect of the dykes and the mischief caused by the barbarians, rendered the country around marshy and uninhabitable. The alluvial soil in the course of ages gradually encroached upon the sea along this coast, and thus Adria became first joined to the main land, from which it was previously detached; and the sea receding from it gradually more and more, the town is now fourteen miles inland. The same causes continuing to operate, the ground was raised by the alluvions many feet above the former level, so as gradually to cover the old forests. Adria, however, although in a state of decay, was never totally destroyed. In 430 it was subject to the Greek empire, having its own magistrates. It made part of the Exarchate of Ravenna, and afterwards came with it under the dominion of the Roman See. In the ninth century we find it governed by its own bishops, under the joint protection of the popes and the emperors. It afterwards formed part of the Marquisate of Este and Ferrara. In the war between Hercules, Duke of Ferrara, and the Venetians, in 1482, Adria was besieged and taken by the latter, and then pillaged and burnt. The citizens who had escaped, having made their submission to the Venetian senate, were restored to their lands and houses, which they began to repair or rebuild. After the war of the league of Cambrai, Adria was, by the peace of Bologna in 1529, definitively given up to Venice. The new town of Adria by degrees arose out of the ruins of the old city, a great part of which had been long before buried under the successive alluvions. Its remains lie to the south of the present town towards Ravegnano, where the old massive walls, and the ruins of an amphitheatre, of baths, aqueducts and mosaic pavements, and other Etruscan and Roman antiquities, are found many feet below the surface of the ground. There is an interesting collection of antiquities that have been dug up, in the house of Mr. Bocchi. The present town of Adria is crossed by the Castagnaro, a branch of the Adige; it has about 9600 inhabitants, and is a bishop's see, although, of late, the bishops reside mostly at Rovigo, which is fifteen miles to the westward of it. The territory of Adria borders on the Roman Legation of Ferrara, the town itself being only three miles north of the Po. Pliny the Elder speaks of the wines of Adria with praise; the country still produces some tolerable wine, and the town trades in cattle, grain, silk, flax, firewood, leather, and earthenware. Under the republic of Venice, Adria was annexed to the Dogado or province of Venice proper, and was governed by a patrician with the title of Podestà, having its own municipal councils and statutes, which were printed in 1707. It now forms part of the Lombardo-Venetian kingdom under the crown of Austria. Luigi Groto, called also the 'blind man of Adria,' a learned man of the sixteenth century, was a native of this town. Adria lies 30 miles S.S.W. of Venice, N. lat. 45° 3', E. long. 11° 1'.

ADRIAN. [See HADRIAN.]

ADRIAN I., Pope, born at Rome, succeeded Stephen III. in 772. Like his predecessor, he had to struggle against the power of the Longobards, who had invaded the Exarchate and other provinces bestowed by Pepin, king of the Franks, on the Roman see. Devastating with fire and sword Sinigaglia, Urbino, and other cities, they advanced as far as Otricoli, on the Tiber, and threatened Rome with the same fate. Desiderius, king of the Longobards, had taken under his protection the two sons of Carloman, the deceased brother of Charlemagne, and he wished Adrian to consecrate them as kings of the Franks, in opposition to their uncle. Adrian refused to do this; and hence arose the bitter enmity of Desiderius. Adrian applied to Charlemagne for assistance. The king of the Franks crossed the Alps by the way of Susa, defeated Desiderius, and overthrew the kingdom of the Longobards in Italy, in 774. Charlemagne then went to Rome, where he arrived on Easter eve, and was received by Adrian with great honours. They repaired together to the Basilica of St. Peter, where Adrian acknowledged Charles as king of Italy, and "Patrician of Rome," and the latter renewed the grant of the provinces bestowed on the Roman see by Pepin. The temporal authority of the popes, however, was far from being permanently established for a long time after; and there are repeated letters from Adrian to Charles, complaining that Bologna, the Romagna, and even Sabina, had not been restored to the jurisdiction of St. Peter. Charlemagne paid another visit to Adrian at Rome in 787, when his son Pepin was christened by the pope. In 787, the seventh general council of the church was held at Nicæa, in Bithynia, where Adrian sent his legates, and in which the worship of images was confirmed, and the iconoclasts were excommunicated. In 791, there was a dreadful inundation at Rome, caused by the overflowing of the Tiber, and Adrian exerted himself in supplying with provisions the inhabitants, by means of boats, which plied to the various parts of the city. He also rebuilt the walls and towers of Rome, and was liberal to the poor. He died after a long pontificate of nearly twenty-four years, on Christmas-day, 795. Charlemagne was much grieved at the news of his death, and wrote his epitaph in Latin verses, in which he affectionately calls him "father." Adrian was a man of talent and dexterity; he succeeded in gaining and preserving the friendship of the greatest sovereign of his time, and he used his influence for the security and prosperity of the people of Rome, and its duchy or territory, without at the same time neglecting the temporal interests of his see. Under him Rome began to breathe again after the continual alarms caused by the Longobards, the last of the barbarian invaders of the Western Empire.—[See Anastasius in Muratori's *Rerum Italicarum Scriptores*, tom. iii.]

ADRIAN II., born at Rome, succeeded Nicholas I. in the papal chair, in 867. He had been married, and had a daughter by his wife Stephania, from whom he afterwards separated in order to live in celibacy. After his election, his wife and daughter continued to live at Rome in a separate house, when an unprincipled man, called Eleutherius, carried off the girl by violence, and on the pontiff retaking his child, the ravisher forced his way into the house and murdered both mother and daughter. For this crime he was tried and sentenced to death by the imperial commissioners, who still exercised the high judicature at Rome. During the pontificate of Adrian, the emperor Ludovicus II. was in Southern Italy, warring against the Saracens, who had invaded part of Calabria and Puglia; he defeated them and took the town of Bari, in 871. It was also during Adrian's pontificate, that Photius, patriarch of Constantinople, withdrew from the Church of Rome, from which time the schism between the Greek and Latin churches dates, which continues to this day. Adrian died in 872, and was succeeded by John VIII.

ADRIAN III., born at Rome, succeeded Marinus in 884, and died the following year on his journey to attend the imperial diet at Worms, after a pontificate of only fifteen months.

ADRIAN IV., an Englishman, whose name was Nicholas Breakspeare, succeeded Anastasius IV. in 1154. He had been a monk, and was made bishop of Albano by Eugenius III., who sent him as his legate, or apostle, as it was then called, to Denmark and Norway. On his return he was elected pope much against his inclination. Rome was then in a very disturbed state. Arnaldo of Brescia, a monk and a disciple of Abelard, had begun to preach a reform in the church as early as 1139, but being driven out of Rome by Pope Innocent II., had taken refuge at Zürich. In 1143, however, he was recalled by the Roman people, who had revolted against Innocent, and had proclaimed a Roman republic, which Arnaldo contributed to constitute. The new government consisted of a senate of fifty-six members, who were annually chosen by an electoral body composed of delegates, ten from each of the thirteen districts of the city. This constitution lasted about fifty years. Arnaldo, who was an eloquent man, strongly condemned the temporalities of the church, and wished to restrict the pope's office to mere spiritual matters. Although he preached no dogma in opposition to the canons, he was condemned by the second council of Lateran, his opinions being styled *political heresy*. Arnaldo partook largely of the newly revived classical fanaticism of those times, which mistook recollections for realities; and he seriously maintained that Rome ought to be, and would again become, the mistress of the world. Several successive popes, Celestin II., Lucius II., and Eugenius III. kept up a sort of desultory struggle against this popular reformer. Lucius in an affray was pelted with stones, and died of the injury received. His successor, Eugenius, was obliged to leave Rome and retire into Sabina. During the confusion that prevailed in the city, the populace plundered and afterwards pulled down the houses of many nobles, cardinals, and citizens, and committed other acts of violence. Adrian IV., after his election, placed Rome under interdict on account of these disorders, and caused all religious services to cease; which measure led the citizens to banish Arnaldo, who took refuge with some barons of Campania; and Adrian then came to reside in the Lateran palace. Frederic of Hohenstauffen, known in Italian history by the name of Barbarossa, had lately been elected emperor by the German Diet, and was on his way to Rome to be crowned. The pope's legates met him on the road, and among other remonstrances, requested that the heretic Arnaldo should be given up by the Viscount of Campania, in order to be tried. Frederic assented to this, and issued orders in consequence; others say that Cardinal Gerard took Arnaldo prisoner, after an obstinate resistance. He was brought to Rome, and delivered to the prefect of the city, by whose sentence he was hanged, his body burnt, and the ashes scattered to the winds, in the year 1155. Meantime Frederic approached Rome with his army, and Adrian went to meet him near Sutri, where, on the latter dismounting, Frederic refused to hold his stirrup, a ceremony on which the popes always insisted, as a mark of respect for their spiritual supremacy. The pope, on his side, refused to salute the emperor with the "kiss of peace," upon which the cardinals were terrified and ran away to Cività Castellana. The question of the ceremonial was debated for two days, when Frederic, having ascertained that such had been the practice with his predecessors, agreed to conform to it. They met, therefore, again at Nepi, and Frederic having held the stirrup, Adrian gave him the *osculum pacis*, and both proceeded towards Rome. The senate and Roman people had on their part sent orators to Frederic, offering him, with their allegiance, the imperial crown, but demanding at the same time five thousand lbs. of silver for the expenses of the coronation, and that the temporal government of the city should be left to them, to the exclusion of the pope. Frederic answered, that he came to give and not to receive laws, and with his army he took possession of the Leonine city on the north bank of the Tiber, and of St. Peter's church, where he was crowned by the pope on the following day. The Romans, however, took no part in the ceremony, but after having held a council in the Capitol, sallied out and attacked the German soldiers unawares. A general battle took place, and continued with great slaughter on both sides, till night separated the combatants. The city continuing in a disturbed state, both the pope and emperor withdrew to Tivoli, whence Frederic returned towards Lombardy. Adrian went afterwards to Benevento, where he made peace with William I., king of Sicily, whom he had excommunicated; and upon their reconciliation he agreed to give him the investiture of Sicily, Calabria, and Apulia, in 1156, on condition of the latter paying a yearly tribute to the see of Rome. The pope returned loaded with rich presents of silks, gold, and silver, and passing through Rome, went to reside at Orvieto, which was subject to the Roman see. Frederic now complained that the pope had violated his faith, by receiving ambassadors and entering into treaties with the king of Sicily and the Greek emperor, without his participation. He also resented the pretensions of the pope and his legates, who seemed to assume that the imperial crown was granted as a *beneficium*, or fee of the see of Rome. Adrian, on his part, complained of the exactions of the imperial commissioners who were sent to administer justice at Rome without his participation; he maintained that the patrimony of the church should be exempt from paying *foderum*, or feudal tribute to the emperor; and, lastly, he claimed the restitution of the lands and revenues of Countess Matilda, of the duchy of Spoleti, and even of Corsica and Sardinia. Thus arose that spirit of bitter hostility between the popes and the house of Hohenstauffen, which lasted until the utter extinction of the latter. But the seeds only were sown in Adrian s time. He died in the beginning of September, 1159, in the town of Anagni, and was succeeded by Alexander III. From the above sketch it may be seen that Adrian IV. stretched the papal prerogatives as far as any of his predecessors had done, Gregory VII. not excepted. [See Fleury. *Histoire Ecclésiastique*, and Raumer, *Geschichte der Hohenstauffen und ihrer Zeit*.]

ADRIAN V., a Genoese, succeeded Innocent in 1276, and died five weeks after his election. He was succeeded by John XX.

ADRIAN VI., born at Utrecht in the Netherlands, of an obscure family, advanced himself by his talents to the post of vice-chancellor of the University of Louvain. The Emperor Maximilian chose him as preceptor to his grandson, afterwards Charles V. Ferdinand of Spain gave him the bishopric of Tortosa. After Ferdinand's death he was co-regent of Spain with Cardinal Ximenes. He was elected pope in 1522, after the death of Leo X., chiefly through the influence of Charles V. whose authority was then spreading over Italy. Adrian was a virtuous and austere clergyman; he endeavoured to reform the numerous abuses of the court and clergy of Rome; he practised a severe economy, and lived frugally. By so doing he displeased the Romans, who had been accustomed to the luxury and prodigality of Leo; and when he died, in September, 1523, after a short pontificate, the people could not conceal their joy. They styled his physician 'the saviour of his country.' He was succeeded by Clement VII. Adrian appears to have been an honest, conscientious man, who fell upon evil times, and was unequal to the difficulties which he had to encounter. He was desirous of maintaining peace, and of stopping, if possible, the schism of the Lutherans by reforming the church, but he did not live long enough to effect any thing essential. Burmann published his life at Utrecht, in 1727.

ADRIANO′PLE, called Edreneh by the Turks, the second city in European Turkey, is in the province of Romania or Rumelia, and on the river Maritza, the ancient Hebrus, which is here joined by the Toonja and the Arda, N. lat. 41° 44′, E. long. 26° 34′, and 135 miles N. W. of Constantinople. It takes its name from the Roman Emperor Adrian (properly written Hadrian) who restored and embel lished it, as he did so many other cities of his dominions. Adrianople 'rises gently on the side of a small hill from the banks of the Hebrus and Tunsa,' [Chishull,] and is about five miles in circumference. When Chishull passed through this city (in 1701) it was the occasional residence of the sultan, whose seraglio stood on a low ground near the confluence of the Maritza and Tunja, embosomed in trees: it is now in a state of dilapidation. The streets of the town are narrow and irregular, but it is well provided with mosques, forty in number, and with baths. The number of inhabitants is 130,000, of whom 30,000 are Greeks. Mr. Alexander, a recent traveller, thinks there may be only 100,000. One of the mosques, that of Sultan Mourad I., was once a Christian church, and another has a great quantity of porphyry in its construction; but the great boast of the town is the mosque of Selim II., built chiefly of materials brought from the ruins of Famagosta, in Cyprus. It consists of one great apartment like a theatre, terminating in a cupola, and has four regular minarets, to the highest balcony of which there is an ascent by 244 steps, or, according to other accounts, 380. But one of the most important constructions of Adrianople is the bazaar of Ali Pacha, near the mosque of Sultan Selim: Chishull says, 'the *sharshées* are two long and fair porticos, walled with brick or stone on each side, and securely arched over head so as to resist fire. The shorter of these adjoins Sultan Selim, and is appropriated to the shoemakers: but the other, being about 400 paces long and 6 broad, is filled with shops of various trades.' Chishull mentions also a madhouse, kept very neat and clean, but the unfortunate inmates were fastened close to the ground by an iron chain round their necks. A large aqueduct supplies the baths, mosques, and fountains with water. Many traces of Roman building may be seen at Adrianople; and several inscriptions have been lately discovered, as well as the trunk of a colossal statue about 12 feet high. The river Maritza, being navigable as far as Adrianople for small craft, contributes to the commercial prosperity of the town. The port is Enos, which retains its ancient name, and stands on one side of the bay, into which the Hebrus flows. The manufactures of Adrianople are silk, woollen, and cotton stuffs; it has also establishments for dyeing, and distilling rose-water and other perfumes, and for tanning leather. Among its chief exports are fine wool, leather, wax, &c. Chishull remarked in his time, 'that about Adrianople grows an excellent red wine.' In the campaign of 1829, when the Russians invaded Turkey and crossed the Danube and the Balkan, they advanced under General Diebitsch as far as Adrianople, when peace was concluded in September 1829. [See Balbi, *Abrégé de Géographie*, 1833. Also, Ersch and Gruber.]

ADRIAN'S WALL. [See Roman Wall.]

ADRIATIC SEA, Hadria, or more commonly called by Latin writers the Upper Sea, (*mare superum*,) was the ancient name of the Gulf of Venice. The term Adriatic (or Atriatic, which Pliny says was the earlier form of the name) was derived from the city Adria [see Adria.] The name Adria is used by Herodotus, but he seems to apply it perhaps rather to the country on the coasts of this gulf. The Adriatic Sea is called by Greek writers the Ionian Bay or Gulf, forming part of the Ionian Sea; but whence the epithet Ionian was derived, there is no satisfactory account.

Horace makes the Hadria wash the Calabrian coast, and Thucydides says (I. 24,) that Epidamnus, now Durazzo, lies on your right as you sail into the Ionian Gulf. According to this, the Adriatic and Ionian Sea would appear to be co-extensive, at least towards the north.

The following is Strabo's account (Casaub. Ed. p. 316.)—'After Apollonia come Balliace and Oreon, and its port Panormus, and the Ceraunian mountains (now Cape Linguetta), which are the commencement of the Ionian Gulf and the Adriatic. The mouth or strait indeed belongs to both, but the Ionian is the name of the *first* part of this sea, and the Adriatic of the *inner* part up to its recess; and now it is the name even of the *whole* sea.'

ADULA'RIA is the name given by mineralogists to the ornamental stone called by lapidaries *moonstone*, on account of the play of light exhibited by the arrangement of its crystalline structure. The term is derived from Mount Adula, in the country of the Grisons, in Switzerland. It is a very pure limpid variety of the common mineral, *felspar*, and is composed of 64 per cent. of silica, 20 of alumine, 2 of lime, and 14 of potash, according to the analysis of Vauquelin. It is found abundantly on the Alps, and on Mount St. Gothard; but the best are from Ceylon, and a very fine specimen has been sold for as much as 30*l*.

ADU'LE corresponds to the modern Zulla, on the west coast of the Red Sea [see Abyssinia]. Zulla is in the recess of a small bay, named Annesley's Bay, and in N. lat. 15° 35′. It is a matter of some curiosity to determine with precision what spot corresponds to the Adule of Cosmas, who was a merchant of the sixth century of the Christian era, and has preserved in his book, entitled *Christian Topography*, a copy of a Greek inscription which he found at this place. Adule at this period was the port of Axum, where merchants traded for ivory and slaves, just as they now do at Massowa, on the same coast—so little are things changed, in many parts of the world, after the lapse of centuries. When Mr. Salt was in Abyssinia he was prevented from visiting Zulla; a friend of his who went there was also prevented by the jealousy of the natives from visiting the remains. All however agreed in saying that there were remains at this place. The name Zulla is sometimes pronounced Thulla, and Adule may readily be admitted to correspond so far as to strengthen the probability of their both designating the same place. Mr. Salt adds, that some of the natives pronounced the name Azoole, which is clearly the same as Adule. D'Anville, in his map of the Red Sea, places Adule at Arkeeko on the same coast, and about 22′ farther north than Zulla. The inscription was found, according to Cosmas, partly on a throne of white marble, and also on a tablet which stood behind the chair, and, as far as we can collect, was a different kind of stone. Till Mr. Salt discovered the inscription at Axum, and compared it with the latter part of the inscription of Adule, it had been supposed that the *entire* inscription on the latter monument referred to one and the same personage, whereas it is now pretty certain that Cosmas has made two inscriptions into one, and caused no little difficulty to the learned world. These inscriptions are really curious, considering the *place* where they were found and the language in which they are written: they may be seen in Montfaucon's *Collectio Nova Patrum*, Paris, 1706, folio, vol. ii., p. 141, in Fabricius' *Bibliotheca Græca* tom. ii., and Chishull's *Antiquitates Asiaticæ*.

The first part of the inscription refers to the third Ptolemy, called Euergetes or the *good doer*, King of Egypt, who, according to the testimony of the stone, was supplied 'with elephants from the Troglodytæ and the Ethiopians, which his father (Ptolemy II.) and himself first hunted in these regions, and having taken down to Egypt, adapted to the use of war.' This Ptolemy reigned from B.C. 247 to 222. The second part of the inscription is in the first person (the first part being in the third), and appears to record the triumphs of some Ethiopian king, whose name does not appear, over many of the people of Ethiopia, and as far as the borders of Egypt. This passage alone is sufficient to show that the second part of the inscription cannot refer to the same person as the first part; for Ptolemy's conquests extended from Egypt to Ethiopia, and not from Ethiopia to Egypt. The second part commemorates also the conquests of this Ethiopian king over some of the nations of Arabia; and we find (which tends to confirm the general accuracy of the facts) that several names are mentioned which we can still recognize in Africa. Among others, the stone speaks of the *Semenæ* or Samene, the people of *Samen* [see Abyssinia], 'a nation dwelling beyond the Nile, in mountains difficult of access, and snow-covered, wherein all through the year there is ice and very deep snow, so that a man will sink up to the knees—these, having crossed the river (says the Ethiopian king), I subdued.' The mountains are clearly the Samen, and the river is the Tacazzé. [See Clinton's *Fasti*, part ii., p. 382.]

ADULT-SCHOOLS are establishments for instructing in reading and other branches of knowledge those persons who have not been educated in their youth. They are designed to meet the wishes of people who are no longer contented to remain uninstructed, and who do not think that the privation of an early education should necessarily entail upon them the evil of perpetual ignorance.

It has generally been found that those who are desirous of acquiring knowledge, and of attaining to a higher state of mental improvement, will better understand and practise the duties of the social system. The results of actual experience on an extended scale have shown the advantages of adult-schools to be even greater than could have been anticipated. They have uniformly worked good, by improving the intellectual and moral condition of persons under their influence.

The first school avowedly established for the purpose of instructing adults was formed in 1811, through the exertions of the Rev. T. Charles, a clergyman in Merionethshire. Some grown-up persons had previously attended his parish sunday-school, but they showed a disinclination to learn with children, and this circumstance led to the adoption of more extended views for their benefit. Considerable success both in the number and progress of the pupils, and their improved conduct and character, caused the establishment of other adult-schools throughout Wales.

About the same time, and without any concert or connexion with the schools in Wales, a school was established at Bristol through the instrumentality of W. Smith. This person, 'who collected the learners, engaged the teachers, and opened the two first schools in England for instructing adults exclusively, in borrowed rooms, and with borrowed books[*],' was the door-keeper to a dissenting chapel. He devoted three out of eighteen shillings, his weekly earnings, to defray the expense of giving to his brethren the means of studying the Scriptures, and of obtaining knowledge from other sources. A short time after these first efforts were made, a society was formed for the furtherance of his benevolent views. In the first report of this society, dated April, 1813, it was stated, that 222 men and 231 women were already receiving education. Adult-schools were soon afterwards established in different parts of the kingdom, at Uxbridge, Norwich, Ipswich, Sheffield, Salisbury, Plymouth, and other places.

These institutions are in general conducted in an excellent spirit. The different committees for their management are usually composed of individuals of various religious persuasions. No party feelings are sought to be instilled—no particular creeds are authoritatively imposed; but means are offered to the persons who attend for inquiring and judging for themselves, and their minds are left perfectly unbiassed.

It has been found that many of the uneducated are unwilling to attend the public schools, in consequence of a dislike to expose their ignorance. To meet this difficulty, the plan of *private* schools has been adopted in Bristol and elsewhere. A few individuals living near to each other meet at their own dwellings, or at some more suitable place, where they are instructed by their benevolent teachers. We have had an opportunity of knowing how much pleasure and profit has been gained from this mode of instruction in a school at Bath now conducted by a few ladies, who, on stated evenings in the week, devote two or three hours to teaching some of the uneducated of their own sex. A poor widow woman, sixty-six years of age, distressed in mind and body, earning a precarious subsistence and wholly ignorant even of the rudiments of reading, commenced attendance on this school three years ago; in a few months she learned to read, and is now unable adequately to express her sense of the happiness she derives from this acquisition. This is not, however, a solitary instance where a person has acquired the difficult art of reading in old age. Many verging on the grave have gladly availed themselves, in the last few months of their existence, of the means afforded them of reading for themselves the hopes and promises held out by the Scriptures. In a few years, perhaps, by a system of mutual instruction, these adult-schools may be made the means of continuing the education begun in youth; for there will, it is hoped, soon be but a small number of adults who will not have acquired the art of reading in their childhood. Scarcely twenty years back (1814), it was reckoned that England alone contained 1,200,000 adults who could not read. In the first annual report of the society in Edinburgh for the support of Gaelic schools, it is stated that 300,000 persons in the Highlands and islands of Scotland could not read either Gaelic or English; and that in the islands, among a population of 14,056, only 1836 could read. We are enabled to add the following particulars respecting an experiment in adult education tried with success by Dr. Johnstone, at Edgbaston Hall, near Birmingham. This school was established about 1815; and the only expense incurred by the individual with whom the plan originated, is that of providing a room once a week, with fire and candle. There are now forty members—more than half the labouring population of the parish—of all ages from eighteen to seventy. The teaching is confined to reading and writing; but there is a prosperous and well-conducted benefit society connected with the institution. The management of the school and the benefit society is in the hands of the men themselves. This point has always been a great object with the founder of the school. The men teach each other; and the affairs of the benefit society are directed by a committee chosen by the members generally. The school assemble once a week, on Sunday evening, for two hours; but the men often go on with their lessons at home in the week days. It is found that a man who is quite ignorant of reading will generally acquire sufficient knowledge to enable him to read with pleasure to himself in the course of six months. It may appear somewhat strange that the men are fonder of writing than of reading. In truth, they show wonderful perseverance in plodding through endless copies, from the large text down to the small hand. In many instances the members of the school have been able to turn their acquirements, small as they are, to very good account. A man who has had the office of standing overseer of Edgbaston parish for seven years, was qualified in the adult school. When he entered it he could neither read nor write. The moral effect of the school has been most satisfactory. A man who has been a leading member for several years, was an habitual tippler before he entered the school; he is now always sober. Though the school has been in existence for seventeen years, there have been only three or four cases of members applying for parish relief during the whole time; and these cases happened in the first period of its establishment. One member has been even reclaimed from pauperism. He was formerly a constant burden on the parish; he is now, however, quite independent of assistance, and has lately opened a huckster's shop.

Adult-schools have likewise been established at Philadelphia and New York. In the latter city there is one opened for adults among the black inhabitants.

ADULTERY is the offence of incontinence between two married persons, or between two persons, one of whom is married. In the latter case it is called single, in the former, double adultery.

This crime was punished by the Jewish law with death; but it must be remembered that the kind of adultery which by the Mosaic law constituted a capital crime, was not every violation of chastity of which a married person, whether husband or wife, may be guilty; but only the sexual connexion of a wife with any other man than her husband. This distinction was analogous to the whole system of the Jewish marriage-law; by which the husband and wife had not an equal right to restrain each other from infidelity; for the former might marry other wives, or take concubines and slaves to his bed, without giving his first wife a legal right to complain of any infringement of her matrimonial rights. The punishment, however, of incontinence in a married *woman* with a stranger was, by the Levitical law, death by stoning, both in the case of the stranger and the adulteress. (Levit. xx. 10, and Michaelis' *Mosäisches Recht.*) By the Athenian law, the husband might kill the adulterer, if he detected him in the act of dishonouring him (Lysias's *Oration on the Death of Eratosthenes*). Under such circumstances, the Code Napoleon expressly authorizes the husband to kill both the offenders.

The Roman law corresponds with the Hebrew law respecting the distinction between the infidelity of the husband and the wife. The civilians define adultery to be the violation of another man's bed (*violatio tori alieni*); so that it appears from the definition itself, that the infidelity of the husband could not constitute the offence. The more ancient laws of Rome, which were extremely severe against the offence of the wife, were silent as to that of the husband. By an old law, an adulteress was to be slain by her husband and his relations (*adulterii convictam vir et cognati uti volent, necanto*). At a later period, by the Lex Julia, adultery in the wife was punishable by her banishment or transportation into some remote island; she also forfeited half her dowry and a third part of her goods; and the adulterer forfeited half his goods to the public use. But although by the Julian law adultery was not punishable with death by a legal sentence, the father of the adulteress was permitted to kill both her and her paramour; and in some cases, the husband had the same power. In the reign of Constantine, adultery in the wife became, by the Roman law, a capital offence; and continued to be so until the time of Justinian, who introduced some mitigation of the punishment.

By the canonical law, however, which is now more or less interwoven into the municipal laws of most Christian countries. adultery is defined to be the violation of conjugal fidelity; and, consequently, the incontinency of the wife and husband stand upon the same foundation. Hence arises the distinction above alluded to between a single and double adultery.

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[*] Pole's History and Origin of Adult-Schools.

Double and single adultery are punishable with various degrees of severity in most of the countries of modern Europe; but it is believed that in none of them, at the present day, is either of these offences capital.

There are some faint traces of the punishment of adultery as a crime in very early periods of the history of English law. Lord Coke says, that in ancient times it was within the jurisdiction of the sheriffs' tourns and courts-leet, and was punished by fine and imprisonment (3 Inst. 306): but at the present day, adultery is not the subject of a criminal prosecution; and in the temporal courts, this offence is exclusively confined to the cognizance of the Ecclesiastical Court, according to the rules of the canon law. Instances of criminal prosecutions in the spiritual courts for adultery are extremely rare; and if instituted to the conviction of the parties, the infliction of a slight fine or penance 'for the benefit of the offender's soul' (*in salutem animæ*), as it was termed, would be the only result. In the year 1604 (2 James I.) a bill was brought into parliament 'for the better repressing the detestable crime of adultery.' This bill went through a committee in the House of Lords; but, upon being reported, it was suggested to the House that the object contemplated by the measure was the private interest of some individuals, and not the public good; whereupon the bill was dropped. [See *Parl. History*, vol. v. p. 88.] During the Commonwealth, adultery, in either sex, was made a capital felony [see Scobel's *Acts*, part ii. p. 121]; but at the Restoration, this law was discontinued.

Adultery, however, comes under the cognizance of the temporal courts in England as a private injury to the husband, though not as a public wrong. Thus a man may maintain an action against the seducer of his wife, in which he may recover damages as a compensation for the loss of her services and affections in consequence of the adultery. For the particular rules and limitations by which this action is governed, see Selwyn's *Nisi Prius*, title 'Adultery.'—[See DIVORCE.]

ADVENT, literally, the approach or coming, is the space of four weeks preceding Christmas, appointed in the English and other christian churches to be kept holy in celebration of the approach of our Saviour's nativity or manifestation. Anciently, the season of Advent consisted of six weeks, and, commencing therefore about Martinmas, used to be called the *Sancti Martini Quadragesima*, or the Forty Days' Lent of St. Martin. It is still of this duration in the Greek church. The first Sunday in Advent, commonly called Advent Sunday, is now the Sunday, whether before or after, which falls nearest to St. Andrew's day (the 30th of November). Marriages are not allowed to be solemnized from the commencement of Advent to the end of the octaves of Epiphany, that is the 14th of January, except by special license.

ADVENTURE BAY, is situated on the south-east coast of New Holland, in latitude 43° 21′ south, and longitude 147° 29′ east. This bay was first discovered by Captain Furneaux in 1773, and was named by him after the ship which he commanded, and which formed part of the expedition under the orders of Captain Cook. The anchoring ground is good and well sheltered, and the neighbouring shore furnishes abundance of wood and water which are easily procured. At the head of the bay is a beautiful sandy beach, two miles long, formed by particles continually washed by the sea from a very fine white sand-stone that bounds the shore. Behind this beach is a level plain, containing a lake with brackish water, where abundance of bream and trout are found. The shores of the bay in other parts, are hilly, and the whole district is very thickly wooded, presenting to view in every direction, a perfect forest of tall trees, with thickets of shrubs beneath, which render it almost impassable. The soil is not deep but rich, consisting of black, vegetable mould. No considerable stream has been discovered in the neighbourhood of the bay. Several small rivulets trickle between the hills, and uniting together form brooks. The spot is occasionally visited by some of the wandering aborigines of the island, who never remain long in one place, but move about in quest of food, having not yet adopted the arts of cultivation or of domesticating animals. The animal principally found in these wilds is the kangaroo, in hunting which the natives show considerable activity. Brown hawks, crows, paroquets, pigeons, and a variety of small birds, frequent the woods, which are also infested by large black snakes and lizards. Insects are very numerous and troublesome; among these are musquitoes and a large black ant, the pain of whose bite is intolerable for a short time. The bay is visited periodically by an abundance of fish of various kinds. Adventure Bay was visited by Captain Cook in 1777, and subsequently (in 1788 and 1792) by Captain Bligh, for the purpose of obtaining wood and water (see *Cook's Third Voyage*, vol. i., p. 93—117. *Flinder's Voyage*, vol. i., introduction. *Bligh's Voyage to the South Seas*, p. 45—54. *Voyage D'Entrecasteaux*, redigé par M. de Rossel, tom. i., p. 48.

ADVENTURE, BILL OF, is a writing signed by a merchant, stating that the property of goods shipped in his name belongs to another, the adventure or chance of which the person so named is to stand, with a covenant from the merchant to account to him for the produce. In commerce, an adventure is defined a speculation in goods sent abroad under the care of a supercargo, to dispose of to the best advantage for the benefit of his employers.

ADVERB, in grammar, the name given to a class of words employed with verbs, adjectives, &c., for the purpose of qualifying their meaning, just as the adjective itself is attached to substantives. In the English language a very large majority of adverbs are distinguished by the termination *ly*, which in the Anglo-Saxon has the fuller form *lice*, and in German, *lich*. Our own language possesses the same suffix in the form *like*, as *godlike*, *gentlemanlike*. These, however, and many other words in *ly* are adjectives, as *manly*, *ugly*; and it is difficult to draw the line between these two classes, many words, especially in the older writers, being used indifferently for both [see ADJECTIVE]. The word to which the adverbial suffix *ly* is added is generally an adjective, but occasionally the adjective has become obsolete in the present form of our language, and must be sought in the Anglo-Saxon. Thus *early* is derived from the Anglo-Saxon *aer*, which indeed still appears in the now poetical forms *ere*, and the superlative *erst*. But though the termination *ly* is derived from the Teutonic portion of our language, it has been applied most freely to adjectives of Latin origin, as *publicly*, *privately*; and with these may be classed the adverbs from adjectives in *ble*, as *horribly*, *agreeably*, in which the liquid belongs at once to the adjective and the suffix. An important class of adverbs are formed by prefixing the old Saxon preposition *an* or *on* to nouns, in which a careless pronunciation afterwards left nothing but the vowel *a*, as *on fote*, now *a-foot*. Lastly, we have an interesting though ludicrous formation depending upon alliteration, *helter-skelter*, *hurry-skurry*, *pell-mell*, *higgledy-piggledy*, &c. The same love of alliteration, which is said to have formed an important element in Anglo-Saxon versification, has also given rise to some adjectives and substantives, as *hum-drum*, *slip-slop*, *tip-top*, *tittle-tattle*, *hurly-burly*.

ADVE'RTISEMENT. In the English, Scotch, and Irish newspapers, and other periodical works, there are annually published more than a million of announcements, which, whatever be their peculiar character, are known by the general name—Advertisement. Each of these Advertisements now pays a duty of 3*s.* 6*d.*; and the gross produce of the tax is about 170,000*l.* The charge for an Advertisement necessarily depends upon its length, and most newspapers have a scale per line. The price of the shortest advertisement, and the increasing price according to length, are regulated, or ought to be, by the number circulated of the work in which it is printed. Advertisements, generally, supply a fund by which newspapers are supported; for, in most cases, the price at which the newspaper is sold is insufficient to pay the cost of the stamp, the paper, the printing, and the expenses of management. Many newspapers have greatly enlarged their size of late years, to allow of the insertion of a large number of Advertisements. Thus one copy of the Times in the whole of the year 1831 contained 4,588 square feet, while one copy of the Star contained only 2,882 square feet;—the Times is a great advertising paper, and the profits of Advertisements allow the proprietors to make their paper nearly twice as large as the Star, although the price is the same. In the greater number of Advertisements the duty of 3*s.* 6*d.* constitutes a tax of 100 per cent. upon the price received for their own benefit by the proprietors of a newspaper;—and there is no doubt that if the tax were materially reduced, the number of Advertisements would be greatly increased. The increase would, however, demand greater attention to classification; and particular publications would, probably, adapt themselves to particular classes of Advertisements. If it were not so, the increase would have an injurious operation upon the efficiency of Advertising as a means of commercial information. The first English Advertisement which can be found, is in the "Impartial Intelligencer," for 1649, and relates to stolen horses. In the few papers published from the time of the Restoration to the imposition of the Stamp Duty, in 1712, the price of a short Advertisement appears seldom to have exceeded a shilling, and to have been sometimes as low as sixpence. [See Nichols's *Literary Anecdotes*, vol. iv.]

ADVICE, in its legal signification, has reference only to bills of exchange. The propriety of inserting the words 'as per advice,' depends on the question whether or not the person on whom the bill is drawn, is to expect further directions from the drawer. Bills are sometimes made payable 'as per advice;' at other times 'without further advice;' and generally without any of these words. In the former case the drawer may not, in the latter he may, pay before he has received advice.

Advice, in commercial language, means information given by one merchant or banker to another by letter, in which the party to whom it is addressed is informed of the bills or drafts which have been drawn upon him, with the particulars of date, &c., to whom payable, &c., and where.

ADVOCATE, from the Latin *advocare*, to call in aid. Among the ancient Romans, an advocate was a person skilled in the laws. The origin of advocates in Rome was derived from an early institution, by which every head of a patrician house had a number of dependants, who looked up to him as a protector, and in return owed him certain obligations. This law established the relation of *advocate*, or patron, and client. As it was one of the principal and most ordinary duties of the patron to explain the law to his client, and to assist him in his lawsuits, the relation was gradually contracted to this extent.

In early periods of the Roman republic, the profession of an advocate was held in high estimation. It was then the practice of advocates to plead gratuitously; those who aspired to honours and offices in the state taking this course to render themselves distinguished amongst the people. As the simplicity of ancient manners gradually disappeared, the services of Roman advocates became venal. At first it appears that presents of various kinds were given as voluntary acknowledgments of the gratitude of clients for services rendered. These payments, however, gradually assumed the character of debts; and at length became a kind of stipend periodically payable by clients to those of the patrician order who devoted themselves to pleading. In this form, it became a heavy oppression, and was always considered to be an abuse. At length the Tribune Cincius, about 200 years before Christ, procured a law to be passed called from him Lex Cincia, prohibiting advocates from taking money or gifts for pleading the causes of their clients. At the time of Augustus, this intended prohibition seems to have become inefficient and obsolete; and a decree of the senate was then passed by which the Cincian law was revived, and advocates were commanded to plead gratuitously, under a penalty of four times the amount of the fee they received. Notwithstanding these restrictions, it clearly appeared that the constant tendency was to recur to a pecuniary remuneration; for in the time of Claudius we find a law restraining advocates from taking exorbitant fees, and fixing as a *maximum* the sum of 10,000 sesterces for each cause pleaded, which would be equivalent to about 80*l*. sterling. [Tacit. *Ann.* xi. 5.] Some years afterwards, Pliny mentions a decree passed in his time, that all litigants in courts of justice, previously to the hearing of their causes, should take an oath that they had neither given, promised, nor secured any reward or money to any person employed as their advocate.

In later periods, as the Roman law diffused itself over great part of Europe, these restrictions upon the pecuniary remuneration of advocates, which must always have been liable to evasion, entirely disappeared in practice; and the payment of pleaders for conducting causes in courts of justice resembled in substance the payment of any other services by those who derived benefit from them. In form, however, the fee was merely an honorary consideration (*quiddam honorarium*), and was generally, but not necessarily. *pre-numerated*, or paid into the hands of the advocate before the cause was pleaded. It was a rule, that, if once paid, the fee could never be recovered, even though the advocate was prevented by death or accident from pleading the cause; and where an advocate was retained by his client at an annual salary (which was lawful and usual), the whole yearly payment was due from the moment of the retainer, though the advocate died before the expiration of the year. [See Heineccii *Elementa Juris Civilis*, p. 132.] Manifest traces of this practice are still to be found in all countries into which the civil or Roman law has been introduced; and are also clearly discernible in the rules and forms respecting fees to counsel at the present day in England.

In countries where the Roman law prevails, the pleaders in courts of justice are still called advocates; their character, duties, and liabilities, being extremely various under different governments. In Scotland, the faculty of advocates consists of pleaders or counsel, admitted, upon an examination, to practise before the Courts of Session, Justiciary, and Exchequer; they are also entitled to plead in the House of Lords in England upon appeals from the Scotch courts.

Advocates in English courts are usually termed *counsel*, and we therefore refer to that title for a particular account of their history, privileges, and duties.

The *Lord Advocate*, or *King's Advocate*, is the principal crown lawyer in Scotland. Previously to the Union, he was one of the great state officers, and sat in parliament by virtue of his office, without election. His duty is to act as a public prosecutor, and to plead in all causes in which the crown is interested, and particularly in criminal cases. Originally this officer had no power to institute criminal prosecutions, except at the instance of injured parties; but in the year 1597, he was expressly empowered to prosecute crimes at his own discretion.

ADVOCATES' LIBRARY. The idea of establishing a library, for the use of the Faculty of Advocates in Scotland, seems first to have been entertained a few years before the Revolution. The author and active promoter of the plan was Sir George Mackenzie of Rosehaugh. Although we have before us that gentleman's inaugural oration, which he pronounced when the library was first opened, as well as several other papers relative to the subject, we cannot well fix the precise date when Sir George's scheme was first approved and adopted by the faculty as a body. In the Latin inaugural oration, which is said to have been delivered in 1689, is the following passage:—'This is the fifth year since the Faculty of Advocates resolved, from gifts of benefactors, and from subscriptions of candidates, to found and establish a library, consisting merely of the works of lawyers, and such other works as tended to the advancement of jurisprudence.' We may conclude from this that the idea was adopted by the faculty in 1684 or 5; but Mr. Alexander Brown, who was librarian to the Faculty of Advocates in 1772, says in the preface to *Ruddiman's Catalogue*, which he edited, 'The plan of forming a public library appears to have been adopted by the Faculty of Advocates about the year 1680.'

At first, the Advocates' Library had no fixed fund, but subsisted and increased by means of donations, not from advocates only, but also from other individuals, and from such sums as the faculty, from time to time, placed at the disposal of the curators. Thus then it happened that although the Advocates' Library, strictly speaking, belonged to the Faculty of Advocates as an exclusive body, it still was early considered as a public library, and was open to the public. This characteristic has rendered the institution very popular, and at the same time promoted its increase. In the year 1700 the greater part of the collection was consumed by fire. During the first nine years after its restoration the library must have increased considerably, since, in the eighth year of Queen Anne's reign, it obtained the privilege of receiving a copy of every new book which, by chapter nineteen of the acts of parliament of that year, was conferred on it, with eight other libraries. Of these, five were Scotch libraries; and the disproportionate privilege may have originated in the desire of the legislature to grant some benefit to Scotland at the time of the Union. Shortly after the Union with Ireland, the same privilege was granted to two Irish libraries.

The whole number of volumes now contained in the library is estimated not to exceed 150,000. Still the Advocates' Library is by far the largest, and also the most valuable in Scotland. In Great Britain there are probably only two libraries, viz., the British Museum and the Bodleian, that out-number it. As might be expected, the collection of law books is very large, but far more complete in ancient than in modern works. Many important modern works of foreign jurisprudence are still wanting. The historical collection is exceedingly valuable, containing almost every work of importance that has been published in England, France, Italy, Spain, Portugal, Denmark, and Sweden: the historical department alone comprises upwards of 20,000 vols. The collection of Greek and Roman classics is choice and extensive; the same may be said of that of modern poetry and *belles lettres;* there is also a very considerable divinity collection, and one of voyages and travels. Science has been much neglected in this library, and this department is insignificant. A collection of Spanish books containing nearly 3000 vols., was, in the year 1824, bought from a London bookseller, at very great expense. There is also a collection of MSS., by no means a large one; several of them are said to be important and available for Scottish history. They are, however, chiefly of local interest. In the year 1825 about 100 vols. of Icelandic MSS. were purchased from Professor Magnuson of Copenhagen. In the following year Mr. Erskine, late of Bombay, made a donation to the library of a few valuable Persian and Sanscrit MSS. There are also a few MSS. of Latin classics, but of no great importance. There is a beautiful MS. of the Hebrew Bible lately purchased in Germany: it is in two large folio volumes: the Pentateuch has, besides the Original, also the Chaldaic paraphrase.

The building which contains the Advocates' Library is not only very confined, but also dark and inconvenient. The historical department is at present separated from the rest, and placed in a very large room built about twelve years ago for the use of the Advocates, but subsequently bought by the writers to the signet, whose library is situated immediately below. A new structure is now building for the reception of the historical department. As far as concerns this department, the building will be unobjectionable in most respects; but the rest of the Advocates' Library is distributed in *eleven* rooms, being for the most part vaults or cellars below the old parliament-house, in which the court of session is now held. Some of these rooms are completely dark, and lighted by lamps; others have only borrowed light; and only three are properly lighted. In addition to the rooms we have mentioned, there is a warehouse belonging to the Faculty of Advocates situate underground in the north-west corner of the Royal Exchange: amongst other things this warehouse contains a very valuable collection of German Dissertations, for the most part productions of distinguished scholars, amounting to upwards of 100,000. This collection was bought at a cheap rate for the library by Sir William Hamilton, professor of history in the University of Edinburgh.

The Advocates' Library is governed by five curators, of whom one goes out of office by rotation every year, and one is chosen in his stead from among the body of the Faculty of Advocates. Under the curators there are, a keeper of the library, an assistant keeper, and two or three assistants. When the funds of the Faculty had somewhat increased, by raising the fees of entrants, the Faculty during a considerable period set apart 100*l.* from the fees of each entrant, and placed the amount at the disposal of the curators. The average of entrants each year has been stated to be seventeen; and thus the annual income of the library at the period here alluded to, along with some additional fees, amounted to 1780*l.* In the year 1728 this system was altered, and the treasurer of the Faculty was ordered to pay 600*l.* annually out of the Faculty's income to the curators for the use of the library. This system still continues.

As to *ease of access*, there is no public institution in Great Britain, and very few in Europe, managed with greater liberality than the Advocates' Library; but we ought in candour to admit that this is a somewhat equivocal compliment. It is, however, surprising, that, although it has become almost a sort of bazaar, or a common lounging-place for a number of idle people, the library has suffered very little in consequence. Any stranger arriving in Edinburgh is admitted without introduction; but some introduction is required for habitually resorting to, and reading in the library. Even borrowing of books is subject to very slight restriction. Each advocate enjoys the privilege of borrowing twenty volumes (formerly twenty-five) at a time; if he wishes to favour an individual, who is not a member of the Faculty of Advocates, with the loan of a book, he has only to sign the initials of his name in the journal or receipt-book, as a security. As there commonly are about two hundred Advocates residing in Edinburgh, and as they are, almost without exception, remarkably liberal in lending books, it is in that city by no means difficult to obtain a free use of a very extensive library.

Of the librarians, or, as they are called in Scotland, 'Keepers of the Advocates' Library,' the two first only deserve to be mentioned as men of literary attainments, viz., Thomas Ruddiman and David Hume. The great philosopher and historian succeeded Ruddiman in the year 1757, but resigned in 1757, and seems to have been but indifferently pleased with his situation. The place of assistant-keeper of the Advocates' Library was, in the year 1825, offered to the eminent philologist, the late Professor Rask, of Copenhagen, with a salary of 150*l.* a-year. This offer was declined. It was likewise offered to several other persons, amongst whom was Professor Benecke, of Göttingen.

While the court of sessions sits, the Advocates' Library opens at nine o'clock in the morning, and shuts at four o'clock, p.m.: during vacation it is open from ten till four.

ADVOWSON. The right of presenting a fit person to the bishop, to be by him instituted to a certain benefice within the diocese which has become vacant. The person enjoying this right, is called the *patron* of the church, and the right is termed an advowson (*advocatio*), because he is bound to advocate or protect the rights of the church, and of the incumbent whom he has presented.

As this patronage may be the property of laymen, and is subject to alienation, transmission, and most of the changes incidental to other kinds of property, it is obvious that it would be liable to be misused by the intrusion of improper persons into the church, if the law had not provided a check upon abuse, by giving to the bishop a power of rejecting the individual presented, for just cause. The ground of his rejection is, however, not purely discretionary, but is examinable at the instance, either of the clergyman presented, or of the patron, by process in the ecclesiastical and temporal courts. [See DUPLEX QUERELA. QUARE IMPEDIT.]

According to the best authorities, the appointment of the religious instructors of the people within any diocese formerly belonged to the bishop: but when the lord of a manor, or other considerable landowner, was willing to erect a church, and to set apart from his possessions a sufficient portion of land or tithe for a perpetual endowment of it, it was the practice to give to the founder and his heirs, in acknowledgment of his beneficence, the right of nominating a person in holy orders to be the officiating minister, as often as a vacancy should occur, while the right of judging of the spiritual and canonical qualification of the nominee was reserved, as before, to the bishop.

This seems to be the most satisfactory account of the origin of *advowsons* and *benefices*, and it corresponds with many historical records still extant, of which examples may be seen in Selden's *History of Tithes*. It also serves to explain some circumstances of frequent occurrence in the division of parishes, which might otherwise appear anomalous or unaccountable. Thus the existence of detached portions of parishes, and of extra-parochial precincts, and the variable extent and capricious boundaries of parishes in general, all indicate that they owe their origin rather to accidental and private dotation, than to any regular legislative scheme for the ecclesiastical subdivision of the country. Hence, too, it is frequently observable, that the boundaries of a parish either coincide with, or have a manifest relation to, manorial limits. The same connexion may, perhaps, have suggested itself to those who have had opportunities of noticing the numerous instances to be seen in different parts of England, in which the parochial place of worship is closely contiguous to the ancient mansion of its founder and patron, and within the immediate inclosure of his demesne.

As an illustration of the respect inculcated in early ages to the patron of a church, we find that the canons of the church permitted him alone to occupy a seat within the chancel or choir, at a time when that part of the building was partitioned off from the nave, and reserved for the exclusive use of the clergy. [See Kennett's *Paroch. Antiq. Glossary*, tit. "Patronus."]

An advowson which has been immemorially annexed to a manor, or to other land, is called an *advowson appendant*, and is transmissible by any conveyance which is sufficient to pass the property in the manor or land itself. It may, however, be detached from the manor, and is then termed an *advowson in gross*, after which it can never be re-annexed, so as to become appendant again.

An advowson is regarded by the law in the double light of a temporal property, and a spiritual trust. In the former view, it is a subject of lawful transfer by sale, by will, or otherwise, and is available to creditors in satisfaction of the debts of the patron. It may be aliened for ever, or for life, or for a certain term of years; or the owner may grant one, two, or any number of successive rights of presentation on future vacancies, subject always to certain restrictions imposed by the law, for the prevention of corrupt and simoniacal transactions.

On the other hand, the spiritual trust which is attached to this species of property is guarded and enforced by very jealous provisions. We have already seen, that the appointment of a duly qualified incumbent is secured, as far as the law can secure it, by requiring the sanction of the bishop to his admission; and although this sanction is, in fact, very rarely withheld, yet it cannot be doubted that the existence of such a check is essential to the well-being of the church. In order more effectually to guard against the danger of a corrupt presentation, the immediate right to present is absolutely inalienable, as soon as a vacancy has actually occurred; and on a similar principle, a purchase of it during the mortal sickness of the incumbent is equally prohibited. [See SIMONY.]

We have seen, that when the proprietor of an advowson exercises his patronage, three persons are immediately concerned: the proprietor, the clergyman who is presented, and the bishop in whose diocese the living is situate; or (in the language of lawyers) the *patron*, the *clerk*, and the *ordinary*. The presentation is usually a writing addressed to the bishop, alleging that the party presenting is the patron of a church which has become vacant, and requesting the bishop to admit, institute, and induct a certain individual into that church, with all its rights and appurtenances. A period of time, limited to twenty-eight days, is then allowed to the bishop for examining the qualification and competency of the candidate, and at the expiration of that time, he is admitted and instituted to the benefice by formal words of institution read to him by the bishop, from an instrument to which the episcopal seal is appended. A mandate is then issued to the archdeacon or other officer to *induct*, *i. e.*, to put the new incumbent into the actual possession of the church and its appurtenant rights; and then, and not before, his title as legal *parson* becomes complete.

It sometimes happens, that two of the three characters of patron, clerk, and bishop, (or ordinary,) are united in one person. Thus the bishop may himself be the patron; in which case it is evident, that presentation is superfluous, and institution alone is necessary. The bishop is then technically said to *collate* the clergyman to the benefice, and the advowson under these circumstances is said to be *collative*.

So the clerk may be the patron, in which case, though he cannot regularly present himself, yet he may pray to be admitted by the bishop; or he may transfer to another the right of presentation, *pro hâc vice*, before the vacancy occurs, and then procure himself to be presented.

Another instance in which the patronage and the parsonage are often found united is in *appropriations*, where, by the concurrence of all parties interested, the advowson, together with the church, its revenues and appurtenances, have in former times been conveyed to some ecclesiastical body, who thus became both the patrons and perpetual incumbents of the living, and by whom the immediate duties of cure are devolved on a *vicar*, or a stipendiary *curate*. The nature and different sorts of appropriations are treated of under that title.

There are instances of advowsons, the patrons of which have power to appoint an incumbent without any previous resort to the bishop for his aid or approbation. These are called *donative* advowsons, because the patron exercises a direct and unqualified privilege of *giving* his church to a clerk selected by himself. The only check upon the conduct of the incumbent in such cases is the power of the patron to visit, and even to deprive him, when the occasion demands it; and the right still residing in the bishop to proceed against him in the spiritual court for any ecclesiastical misdemeanour. It is the opinion of the most eminent lawyers, that donatives had their origin in the king, who has authority himself to found any church or chapel exempt from the episcopal jurisdiction, and may also, by special licence, enable a subject to do the same.

Sometimes the *nomination* is distinct from the right to present: thus, the owner of an advowson may grant to another the right to nominate a clergyman, whom the grantor and his heirs shall be thereupon bound to present. Here it is obvious that the person to whom the right of nomination is given is substantially the patron, and the person who presents is merely the instrument of his will. So, where an advowson is under mortgage, the mortgage creditor is bound to present any person who shall be nominated by the mortgagor.

It is sufficiently apparent that this species of property is coupled with a trust, in the faithful performance of which the public are deeply interested. If, therefore, upon the vacancy of a living, no successor, or an insufficient one, shall be presented, it is put under *sequestration* by the bishop, whose care it then becomes to provide for the spiritual wants of the parish by a temporary appointment, and to secure the profits of the benefice, after deducting expenses, until another incumbent shall be duly inducted. After a vacancy of six months, occasioned by the default of the patron, the right to present *lapses* to the bishop himself. On a similar default by him, it devolves to the archbishop, and from him again to the king as paramount patron; the period of six calendar months being allowed to pass in each case before the right is forfeited to the superior. A donative advowson, however, is excepted from the general rule; for there the right never lapses by reason of a continued vacancy, but the patron is compellable to fill it up by the censures of the ecclesiastical court.

When the incumbent of a living is promoted to a bishopric, it is thereby vacated, and the king, in virtue of his prerogative, has a right to present to it in lieu of the proprietor of the advowson. This singular claim on the part of the crown appears to have grown up since the Reformation, and was the subject of complaint and discussion down to as late a period as the reign of William and Mary. It is difficult to reconcile it to any rational principle, although it has been urged by way of apology, that the patron has no ground to complain, because the king might, if he pleased, enable the bishop to retain the benefice, notwithstanding his promotion, by the grant of a *commendam*: so that the patron sustains no other injury than what may result from the substitution of one life for another. It is, however, certain that, by successive promotions, the crown may, in fact, deprive the patron of his right for an indefinite time, and an instance is known to have actually occurred wherein the patron of the metropolitan parish of St. Andrew was prevented by several such exertions of the royal prerogative, from presenting to his own living more than once in 100 years. [See the arguments in the case of the vicarage of St. Martin's, reported by Sir B. Shower, vol. i. p. 468.] So that, as was truly observed by the counsel in that case, the safest course that could be adopted by an unconscientious patron, with a view to retain in his own hands the future enjoyment of his right, would be to present a clergyman whose qualities are not likely to recommend him to higher preferment.

The following cases may be selected as best illustrating the peculiar nature of this sort of property.

If a man marries a female patron, and a vacancy happens, he may present in the name of himself and wife.

Joint tenants and tenants in common of an advowson must agree in presenting the same person; and the bishop is not bound to admit on the separate presentation of either. Co-heiresses may also join in presenting a clergyman; and if they cannot agree in their choice, then they shall present in turn, and the eldest shall have the first turn.

When the patron dies during a vacancy, the right to present devolves to his executors and not to his heir: but where the patron happens also to be the incumbent, his heir, and not his executor, is entitled to present.

Where the patron is a lunatic, the lord chancellor presents in his stead; and he usually exercises his right in favour of some member of the lunatic's family, where it can with propriety be done.

An infant of the tenderest age may present to a living in his patronage, and his hand may be guided in signing the requisite instrument. In such a case it is needless to say that the guardian or other person who dictates the choice or directs the pen is the real patron; but the court of chancery would doubtless interfere to prevent any undue practice.

It is believed that the following table presents a tolerably accurate synopsis of the distribution of ecclesiastical patronage in this country.

Rectories and Vicarages in the patronage of	
The Crown	1048
Bishops	1301
Deans and Chapters	982
Universities	597
Other Colleges	146
Private Persons	6619
Chapels in private patronage	649
Total number of benefices in England and Wales	11,342

[See further, Burn's *Eccles. Law*, tit. *Advowson, Benefice, Donative.* Selden's *History of Tithes.* Gibson's *Codex*, vol. ii.]

ADVOWSONS, VALUE OF. The following plain rules for estimating the value of advowsons may be of use. The bargains which are usually made with respect to advowsons are, either for the advowson itself, *i.e.*, the right of presentation for ever, or for the right of presenting the next incumbent, *i.e.*, the next presentation. In both these cases there may be circumstances peculiar to the living itself, which fall under no general rule, but which must be considered and allowed for in valuing the advowson as a property. For example, a curate may be necessary; the parsonage-house may be in a state which will entail expenses on the next incumbent; and so on. Again, the property itself is of a nature more likely to be altered in value by the act of the legislature than the fee-simple of an estate. The following rules, therefore, give the *very highest value* of the advowson, and any purchaser should think twice before he gives as much as is found by them.

To find the value of the perpetual advowson of a living producing 1000*l.* a year, the present incumbent being forty-five years of age, and money making four per cent., we must first find how many years' purchase the incumbent's life is worth, and here we should recommend the use of the government, or Carlisle tables, (see ANNUITIES,) in preference to any other. Taking the latter, we find the annuity on a life of forty-five at four per cent., to be worth fourteen and one-tenth years' purchase; but at four per cent. any sum to be continued annually for ever is worth twenty-five years' purchase. The difference is ten and nine-tenths years' purchase, or for 1000*l.* a year, 10,900*l.*, which is the value of the advowson.

In finding the value of the next presentation only, other things remaining the same, the seller will presume that the buyer means to make the best of his bargain by putting in the youngest life that the laws will allow, that is, one aged twenty-four. The value of an annuity on such a life at four per cent. according to the Carlisle tables, is seventeen and eight-tenths years' purchase. And as we are giving the highest possible value of the advowson, omitting no circumstance which can increase it, we will suppose the next incumbent to come into a year's profits of the living immediately on his taking possession. The present value of the next presentation is the value of an annuity for 17·8 years, beginning from the present year. The rule is this: take four per cent. of the value of the present incumbent's life, or 14·1 × ·04, which gives ·564; subtract this from 1, which gives ·436; divide by 1 increased by the rate per cent., or 1·04, which gives ·419; add one year's purchase to the presumed value of the next incumbent's life, (17·8,) which gives 18·8, multiply this by the last result, ·419, which gives 18·8 × ·419, or 7·88 nearly—the number of years' purchase which the next presentation is now worth—which, if the living be 1000*l.* a year, is 7880*l.*

For the Carlisle Table of Annuities, see Milne *On Annuities*, vol. ii. p. 595. For the Government Tables, see Mr. Finlaison's *Report to the House of Commons*, ordered to be printed 31 March, 1829, page 58, column 6.

A'DYTUM, a Greek term signifying a place that may not be entered, and applied to the innermost and secret chamber of a temple.

In the ancient Egyptian temple, the Adytum is placed at the end of a series of propylæa, porticoes, and vestibules, and surrounded by galleries and chambers, which afforded every facility for concealing the mysteries of the interior. In the temples of the Greeks there is nothing corresponding to the Adytum of the Egyptian temples, unless it be the chamber which, in the Parthenon at Athens, has been called the Treasury, but which is not commonly found in other structures of the same character. The temples of the Romans, also, are without obvious adyta, though the exhumation of Pompeii has discovered to us, in the temple of Isis there, a small chamber behind and under the altar and statue of the goddess, with means of secret access, from which probably the oracular responses were delivered. We may fairly conclude that something of the same kind existed wherever oracles were delivered and the deity was not supposed to speak through an inspired representative, as in the case of the Pythia at Delphi; but no discoveries have been made in the ordinary temples of the Greeks and Romans to confirm the opinion, beyond the instance we have just mentioned.

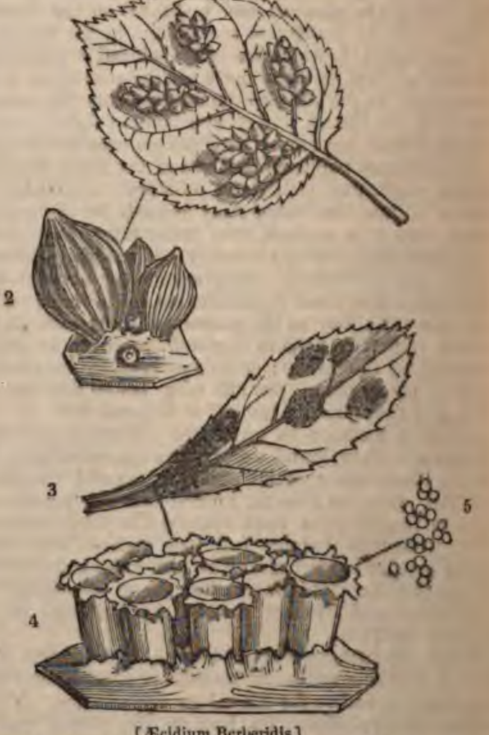
The 'most holy place,' or the Sanctum Sanctorum, the holy of holies, was the adytum of the temple of Solomon at Jerusalem, which may reasonably be believed to have been built in the form and after the manner of the temples of the Egyptians.

ÆCI'DIUM, a genus of minute parasitic plants belonging to the natural order Fungi, found in great abundance in this and other northern countries. By some modern writers it has been combined with Uredo and others; but it appears distinctly characterized by its peridium, or enveloping membrane, having a tubular form, and being altogether distinct from the cuticle of the plant on which it grows.

The species are universally parasitic upon the leaves, or flowers, or bark of living plants, where they are generated beneath the cuticle. Their structure is of the most simple kind; consisting of nothing more than a little mass of excessively minute sporules, or reproductive particles, much smaller than the finest sand, inclosed in a thin bag, of either a fibrous or reticulated structure, which in time pierces the cuticle under which it lies, gradually assumes a tubular appearance, and finally bursts at the apex for the purpose of enabling the sporules to escape.

A great many species are found upon the weeds and trees of Europe, varying in colour, size, and form. Of these the two following are among the most common.

Æcidium cancellatum, the Pear Æcidium (*Pers. Synops.* 205). This plant is often very common, in the latter months of autumn, on the back of the leaves of the cultivated pear-tree, to which it gives a singularly warted aspect. It makes its appearance crowded in little patches of a pale brown colour, which, when examined with a microscope, are seen to consist of numerous oval bodies, about a line long, rather the broadest towards the upper end. These bodies are, when young, slightly furrowed, but at a more advanced



[Æcidium cancellatum.]

[Æcidium Berberidis.]

period they divide into tough parallel fibres, which open at the sides, but do not separate at the apex. Through the passages thus formed between the fibres fall the sporules, or seed-like particles.

To inaccurate observers this species would appear an aggregation of the nests of some minute insect, for which we know it to be often mistaken. It probably does not produce any injurious effect upon the plants it attacks, for it generally makes its appearance late in the season, when the leaves have nearly completed their office for the year.

Fig. 1. in the accompanying wood-cut, represents the appearance of this species, of the natural size. Fig. 2. exhibits four of the peridia in different states of growth, and very highly magnified.

Æcidium Berberidis, the Barberry Blight (*Pers. Synops.* 209. *Greville, Scott. Crypt. Fl.* t. 97). The bright orange powder that collects upon the leaves and flowers of the common barberry consists of the sporules of this species, which are discharged from thousands of little tubular apertures, that spread in patches over all the tender parts. These apertures are the open ends of the peridia in a state of maturity, and are bordered at first by a ragged toothed membrane, which finally falls away. Among the many beautiful objects that are to be met with in the lower and more imperfect tribes of plants, it is difficult to find one more worth an attentive examination than this, which has been well illustrated by Dr. Greville in his *Scottish Cryptogamic Flora;* in that work we find the following remarks upon the popular opinion, that barberry bushes blight corn.

'This minute gastromycus has given rise to the vulgar opinion that the neighbourhood of barberry bushes is extremely detrimental to fields of wheat. It is well known that the disease called the *rust* in corn is highly injurious; but the colour of the rust and that of the present plant constitutes the only similarity between them. They belong, in fact, to two different genera, and of course cannot propagate each other. I have, nevertheless, heard creditable people affirm that they have seen the corn fail for a considerable distance round a barberry bush, while it was strong and fertile in the rest of the field. If this is in reality owing to the barberry (which I do not think), it must be attributed to some other cause than this parasitic plant.' For an account of the species which really infests corn, see PUCCINIA *graminis*.

Fig. 3. is the appearance of Æcidium Berberidis to the naked eye. Fig. 4. is a patch of the peridia very highly magnified; Fig. 5. shows the sporules still more magnified.

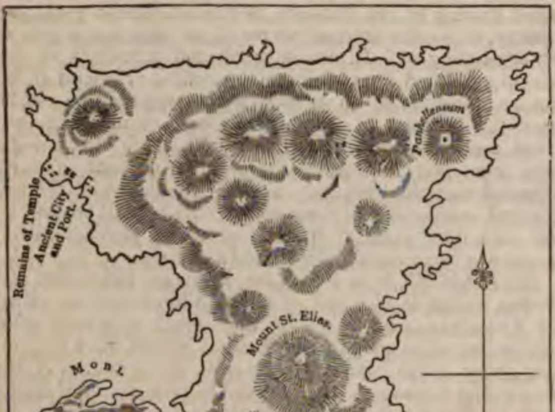
ÆDI'LES, from *ædes*, a building; the name given to certain magistrates in ancient Rome. They were four in number, two entitled *curule* ædiles, and two *plebeian*. It is difficult to mark the limit between the duties of these magistrates. The former, however, must have been originally connected with the patrician order, and elected by the *comitia curiata*. Their insignia of office were the same as those of the kings had been, viz., the purple robe called the *toga prætexta*, and the chair ornamented with ivory, or *sella curulis*. They had the care of the temples, baths, porticoes, aqueducts, sewers, and roads of the city. They presided at the religious celebrations, of which theatrical exhibitions formed an important part; and, in performing this duty, the ædiles, under the republic, were often guilty of the most lavish expenditure with the view of acquiring popularity, and thus paving their way to the higher offices of the state. The plebeian ædiles were, as their name imports, specially magistrates of the *plebes* or commonalty. They were subordinate to the tribunes of the *plebes*, and acted as judges in such causes as were referred to them by their superiors. The temple of *Ceres*, which constituted the treasury of the commonalty, was under their peculiar guardianship. They here received the fines paid for offences against the plebeian magistrates, and made a distribution of bread among the poor of their order. In the same temple, too, they preserved the public records connected with their own body, and the decrees of the senate. The care of the public buildings and streets on Mount Aventine and in the immediate neighbourhood, which in early times formed the chief residence of the commonalty, and was without the limits of the city, must have been, we may infer from their title, entrusted to the plebeian ædiles. Their persons, like those of the tribunes, were inviolable. There were other duties connected with the office of ædile, whether curule or plebeian, such as the inspection of the markets, and the superintendence of the corn trade, the examination of weights and measures, the registration of courtezans, and perhaps the general management of all matters of police in Rome and the suburbs: they had, of course, their courts for inquiring into and punishing offences connected with their office. The curule ædileship was the second in the series of honours through which the Roman candidate proceeded to the consulship; and the laws required an interval of a whole year after the close of the quæstorship, before any one could be a candidate for the ædileship. The title of ædile was known also in the municipal towns of Italy.

ÆGA'GRE (CAPRA AEGAGRA), a wild species of Ibex, called Paseng by the Persians, and believed, with great probability, to be the original source of at least one variety of the domestic goat. In the stomach and intestines of this animal are found those peculiar concretions or calculi called Bezoar stones, to which European physicians of the middle ages, the disciples of the Arabic school of medicine, imputed such wonderful properties; and which still enjoy a high reputation throughout the east, on account of their supposed medicinal virtues. For an explanation of the nature and composition of these concretions, as well as the history and description of the animal which produces them, we must refer to the articles BEZOAR and GOAT.

ÆGE'AN SEA is the name given by the Greek and Roman writers to that part of the Mediterranean now called the ARCHIPELAGO. We shall here speak of it with reference to the terms used by the classical writers when they allude either to the sea itself, the coasts that bound it, or the islands that it contains. The Ægean Sea was bounded on the north by Macedonia and Thrace, on the west by Greece, on the east by Asia Minor, and comprised between the 41st and 36th degrees of latitude. The origin of the name is doubtful; geographers derive it from different islands, or places on its shores, as Ægæ, Æga, Ægæa; or, more fabulously, from Ægæa, Queen of the Amazons, who perished there; or from Ægeus, the father of Theseus, who threw himself into it; or it may be derived, according to some, from the Greek word *αἰγὶς*, a squall, from the violent and sudden storms which render it dangerous to sailors even in the present improved state of nautical science. But the true origin of the name is unknown, and we should rather refer it to old King Ægeus than to any one else. It contains numerous islands, many of which are undoubtedly of volcanic origin. Of these the more southern are divided into two groups; one called the Sporades, or scattered islands, lying along the coast of Caria and Ionia; the other called the Cyclades, or circling islands, lying off the coasts of Attica and Peloponnesus, from which they were separated by the Myrtoan Sea, and occupying a large part of the southern Ægean. Another portion of the Ægean, lying about Icaria, one of the Sporades, was also called the Icarian Sea. The northern part of the Ægean contains fewer, but larger islands; the principal were called Chios, Lesbos, Lemnos, Thasos, and Eubœa. At the north-east corner, it communicates with the Propontis (Sea of Marmara) by the narrow strait called the Hellespont, now the Dardanelles; the Turks call it the White Sea, to distinguish it from the Black Sea; it must not, however, be confounded with the White Sea in the north of Russia. [See ARCHIPELAGO.]

ÆGI'NA, an island in the gulf of E'ghina, which retains its ancient name, with a very slight alteration. The 37° 47′ of latitude passes through the northern extremity of the island; its extent may be estimated by the scale attached to the accompanying plan, from Captain Copeland's recent survey.

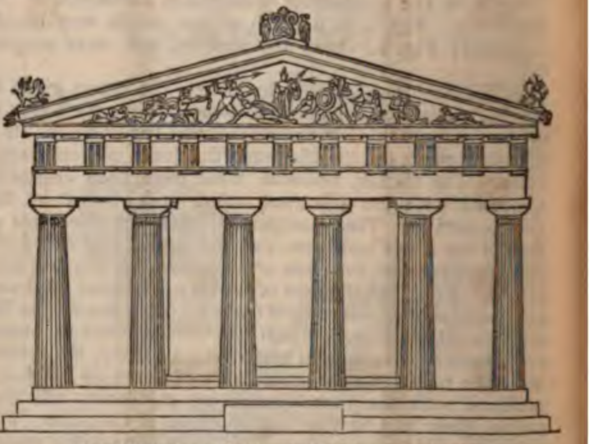
Strabo reckons Ægina to be 180 stadia in circumference, which, allowing nine stadia to a mile, will fall considerably short of the truth, if we reckon the numerous windings of the coast. The western part of the island is a plain, which, though stony, produces corn. A hill, called Mount St. Elias, or Oros, with its offsets, occupies the southern part of the island, and in the north-eastern we find a ridge, which, on one of its eminences, has the remains of the ancient temple of Jupiter Panhellenius, as it is commonly called. In the north-west part of the island there stand two columns, one of which is entire, marking the site of an ancient temple, with whose name we are unacquainted. To the south of these columns the site of the ancient town is distinctly shown by the remains of two artificial harbours, which have been formed, as was usual with the Greeks, by projecting moles, with a narrow entrance between them. The walls on the land side, which were about ten feet thick, can be traced through their whole extent. There were probably three principal gates, the central one leading to the eminence in the eastern part of the island, on which the remains of the ancient temple stand. This temple is situated amidst pine trees, on the summit of a mountain, and separated by a narrow valley from the hill on which the modern town of Eghina stands. The position of this edifice is striking. Placed in the middle of the gulf of Eghina, it offers a panoramic prospect of the whole bay. Athens and its Acropolis are eighteen miles distant N.N.E., and the towering Acropolis of Corinth thirty-seven miles to the N.W. (Leake's *Morea*, 3 vols. 8vo. 1830.)



On casting our eyes on this little island, we should almost doubt the stories of its ancient importance, if they were not as well authenticated as any part of remoter history. We know nothing worth mentioning here of its inhabitants before it was occupied by the Achæi (*Homer's Iliad*, ii. 562), and afterwards by some Dorians from Argos—a nation that spread over a large part of the Peloponnesus, and sent out colonies to Italy and Sicily, and formed in fact one of the chief component parts of that people known to general history under the name of the Greeks. Like some small republics of modern times, such as Genoa and Venice, Ægina owed its importance entirely to its naval superiority. It would however be difficult to see how so small an island could become a formidable naval power, if we did not know that its approach was rendered difficult by numerous rocks, and that at an early period it became a place of security for persons and their property. It is impossible that a place like Ægina could ever rise to importance except as an emporium or mart, which offered the advantages of security and a central position. Wealth being once introduced, would, by industry and perseverance, be increased, and a navy once established, would perpetuate itself by the profit derived from a carrying trade. As early as B.C. 563, in the reign of Amasis, before any town of European Greece had acquired great commercial wealth, we find that Ægina had a factory established in Lower Egypt for its merchants, which is exactly the same kind of thing that we have seen so often repeated in modern times, where the commercial towns of Europe have, by force or fraud, succeeded in establishing themselves in remote countries. In this century, according to the testimony of Aristotle, this little spot contained 470,000 slaves. This number is certainly extravagant; but we may consider it as indicating a very large population. Ægina was then one of the great centres of the Mediterranean commerce, and in all probability a considerable slave market.

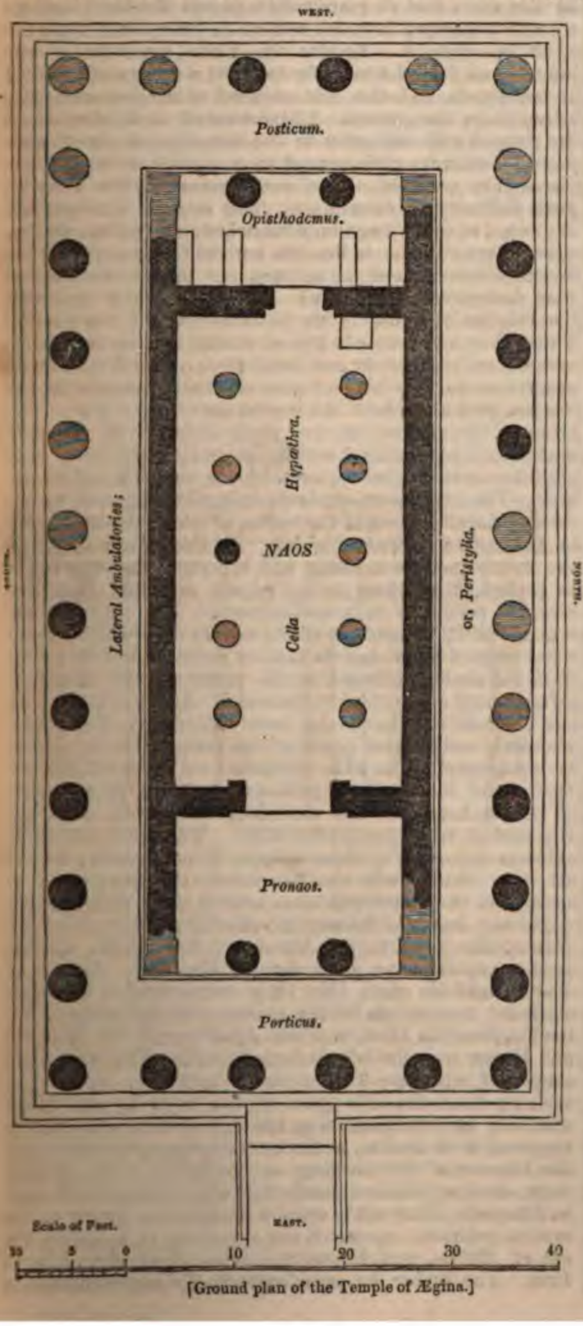
When Xerxes was on the banks of the Dardanelles in the year B.C. 480, with his enormous army, previous to crossing over into Europe, he saw, says Herodotus, the corn-fleet sailing by, carrying the harvests of the fertile regions on the Black Sea to the Peloponnesus and Ægina. Ægina had very early a silver coinage, and many of its coins still exist, though we are not aware what is the remotest epoch to which they belong. The most common type or figure on one side is the sea-tortoise. The story is that Pheidon, King of Argos, who also possessed Ægina, made a mint of silver in that island about B.C. 894; and it certainly was a tradition among the Greeks that, as early as that period, Ægina was the centre of an extensive commerce. [See an *Essay on Money*, Hatchard and Son. 1833.] When Xerxes invaded Greece B.C. 480, the people of Ægina took a brilliant part in the great sea-fight of Salamis. They sent thirty ships, besides those which guarded their own island, and were allowed to have acquitted themselves better than any other Greeks; which tended to wipe off the disgraceful imputation of previous treachery to the common cause, of which they were apparently not altogether guiltless. This event may be fixed as the latest period of their great prosperity, which had probably lasted for more than a century; and we must therefore assign the building of the great temple of Jupiter Panhellenius to some period in the sixth century before our æra. We may indeed almost with certainty fix it before B.C. 563, when the Æginetans built a temple to their great national god, Jupiter, in Egypt; which they would scarcely have done before they had erected one at home. After the Persian wars, the old jealousies of Athens and Ægina again broke out, and finally resulted in the more powerful state taking possession of the island, B.C. 430, and expelling the Æginetans. A remnant of them was restored by Lysander at the close of the Peloponnesian war, B.C. 404; but Ægina never after recovered its importance. Sulpicius, one of Cicero's friends, when consoling the illustrious orator for the loss of his daughter, enumerates Ægina among the instances of the vicissitudes of fortune, and as an example of fallen greatness. (Cicero's *Letters to various Persons*, iv. 5.)

Of late years the situation of Ægina, as a secure and central position, has made it the occasional meeting-place of the Senate of Greece, and residence of the governor; and several schools have been established here. The latest report that we have seen of their condition is not favourable. In the central school of Ægina, at the time of Professor Thiersch's late visit, nothing beyond Greek and a little mathematics were taught. (See *Journal of Education* No. 6.) The orphan asylum established here by the late President Capo d'Istrias, in the little town of Eghina, is described by the German professor as a failure. A previous account said there were 1500 pupils in this island, and an extensive Greek printing-house. But till Greece is in a more settled state, it is impossible to give anything like accurate information on the present condition of this island. Some accounts say that the island has 4000 inhabitants. It is known for the good almonds which it produces.



[Front Elevation of the Temple of Ægina, as restored.]

Ægina Temple. The temple of Jupiter Panhellenius, before referred to, or the Panhellenium of Ægina, as it is often called, was of the Greek Doric style or order, and of the arrangement which is technically termed hexastyle, peripteral, and hypæthral; that is, it had a portico of six columns at each end, and ranges of twelve columns along each side, the columns on the angles being counted both in flank and in front; and internally it was divided into what may be termed nave and aisles, by two ranges of columns, the space between which was uncovered. The cell or body of the temple was a regular parallelogram, inclosed by four walls: access was given to the interior by doors in the cross-walls, from inner porticoes formed by the longitudinal extension of the flank walls, the projecting shoulders of which are termed antæ, and between which two columns stand, thus forming what are distinguished as the pronaos and opisthodomus. The columns of the peristyle on the sides stand nearly as far from the walls as they do from each other; and on the fronts, the space intervening between the outer columns of the porticus and posticum (to use the technical terms by which the front and rear-front porticoes are respectively distinguished), and the inner ones and their antæ, of the pronaos and opisthodomus respectively, is somewhat more than a single intercolumniation. Thus, a kind of gallery was formed on the floor of the peristyle around the body of the temple, and this was raised by three deep steps from a nearly level platform called a *peribolus*, in the midst of which the temple stood; this was partly hewn out of the native rock, and partly constructed, and a low wall or parapet girded it on all sides. The temple fronted east and west, the east being the entrance front before which the peribolus extended itself more than 100 feet, while on the west it was not more than 50 feet wide. The extreme length of the temple in front, measured on the face of the lowest step of the regular stylobate, is 49 feet 10·2 inches, and in flank 100 feet 7·7 inches; and on the floor of the peristyle, that is, at the edge of the upper step on which the columns rest, the corresponding dimensions are, 45 feet 2·2 inches, and 96 feet. The columns of the peristyle are a very small fraction less than 3 feet 2·9 inches in diameter, and including their capital, they are 17 feet 9·4 inches in height; the entablature, without the crowning moulding of the pediments, is rather more than two diameters of a column in height, and the stylobate is 3 feet 7·7 inches high, or an eighth more than one diameter. The height of the tympana of the pediments to the soffit of the corona was, as nearly as it can be determined, one diameter and four-fifths, and that of the pediments to their apices, two diameters and two-sixths; making the whole height, from the floor of the peribolus to the summit of the pediments, 35 feet 8 inches, above which the acroterium rose nearly one diameter, or about three feet more. Both the tympana were highly enriched with sculptures, but it does not appear that there were any in the metopes of the outer entablature, or on any part of that of the inner ordinance of the pronaos and opisthodomus, as in the cases of the Parthenon and the temple of Theseus at Athens. It is true that Dr. Chandler discovered a sculptured fragment among the ruins, which, from some indications, he fancied to have belonged to one of the friezes; but later examinations make it probable that what he found belonged rather to the sculptures of the eastern pediment.



[Ground plan of the Temple of Ægina.]

The columns of the Panhellenium are within a small fraction of five diameters and a half in height, and they diminish, with an imperceptible entasis, in the length of the shaft, considerably more than one-fourth,—from 3 feet 2·9 inches to 2 feet 4·6 inches. In the peristyle, and in the pronaos and opisthodomus, the columns have twenty flutes, while those of the inner hypæthral ranges had but sixteen.

The annexed plan and elevation will convey a clear idea of the arrangement of the structure. The darker tint on the plan indicates the portions of the walls which remain, or whose places are not obliterated, and also the sites of the still remaining columns; the lighter tint shows the restorations. The ends of the walls forming the antæ are restored from analogy, and from displaced fragments discovered among the ruins;—the places of the deficient columns of the peristyle admit of no doubt, and those of the internal ranges are tolerably certain. Only *one* column remains of the internal ranges, but this determines the diameter and the distance from the walls of all the rest, and consequently the breadth of the hypæthral part or nave; but the number of columns in each range, and therefore their distances from each other, cannot be determined with certainty. However, the authority of the second volume of the Antiquities of Ionia would decide this, as its authors profess to have ascertained the position of five of the columns of these inner ranges, of which three were in continuous succession. The principal front of the temple would be sufficiently indicated by the greater depth of the inner portico or pronaos, even if the greater extent of the peribolus, and the superior merit of the sculptures at the east end, did not determine it. The meaning of the rectangular blocks of stone in the opisthodomus, and of that within the cella in the hypæthral range by the western door, is not obvious; nor does any reason offer itself for the place of that door being out of the middle, though its narrowness may mark its inferiority. Possibly, however, these irregularities and discrepancies may have been occasioned at some period during the middle ages, when, according to the belief of some writers, the old ruined temple was used as a church. A more graduated ascent than the regular gradus to the floor of the peristyle has been made, for more convenient access to the eastern portico; for it may be noticed that the steps of the stylobate are so deep as to make them inconvenient for use; probably, however, this too was the work of the later period before referred to. The elevation here given is applicable to either of the two fronts, though the sculptures indicated are those of the western pediment. The structure was built of the fine white limestone of the island, but through long exposure it has assumed a rich brown colour; the tiles used in covering were of the same material, but the sculptures appear to be of Parian marble. It may be remarked, too, that the surfaces of the tympana were painted of a light-blue colour to give the statues greater relief; and the statues themselves were also partially painted for the same purpose. The mouldings also appear to have been painted.

The style of the architecture of the Æginetan Panhellenium would of itself indicate an earlier date than that of the Athenian temples of the age of Pericles, but it would hardly lead us so far back as the early part of the sixth century before Christ; though it is not at all inconsistent with that period, which for another reason has been assumed for it. Some antiquaries have referred the execution of the sculptures which belonged to the Panhellenium to the latter part of the same century; but there is nothing in the reasoning by which they come to that conclusion that will not admit of these sculptures being referred to a remoter period. The great diminution of the columns; the great comparative depth of the capital, and its peculiar boldness of character; the greater comparative heights also of the stylobate and entablature, carry it back from the date of the Parthenon and the style of that period; while the height of the columns in proportion to their diameter, and the beauty of contour of the mouldings, and of other details, sufficiently remove it from the time of the heavy proportions and comparative rudeness of the older remains of Corinth. It differs too from all the Grecian temples of later date in the number of columns on its flanks.

It is unknown when the Panhellenium fell into ruins. Becoming neglected, and being exposed to the ravages of time and the shocks of earthquakes, one part after another must have fallen away until its dislocated joints offered to view portions of metal cramps, which would induce barbarian spoilers to rack it into pieces, till at length it became the ruin it now presents.

The subjoined sketch is a view of the temple in its present state. It is taken on the west front, looking eastward and northward; the walls are thrown down, though their site is not obliterated. A reference to the plan will show that the two columns in the foreground are the only remaining of the west portico, and that the two couples which appear within the external peristyle are those of the opisthodomus and pronaos. In the distance the view embraces the Saronic Gulph and the mountains of Attica.

[Ruins of the Temple of Ægina.]

This sketch, with the foregoing plan and elevation, were kindly furnished by Mr. W. Jenkins, Jun., architect, who made the original drawings and actual measurements of the remains on the spot, in October, 1820.

It is understood that Mr. Cockerell intends to publish a work on the Panhellenium, to which we must refer for more particular information than can be given here, and to the second volume of the *Antiquities of Ionia*, published at the expense of the Society of Dilettanti.

The sculptures which occupied the tympana of the pediments of the Panhelleniun were discovered in May, 1811, by a party of English and German travellers, among whom were Messrs. J. Foster, of Liverpool, and C. R. Cockerell, of London, who were pursuing their studies as architects. They were found buried under the ruins of the building and accumulations of rubbish, nearly as they had fallen from their places, especially those of the western front, the whole of which were recovered; but unfortunately not more than half of those of the eastern front could be determined. They are at present at Münich, having been allowed by the English government at that time, to fall into the hands of the present king of Bavaria (then the Prince Royal), who had them transported to the capital of Bavaria. Thorwaldsen was engaged to restore the statues. The Æginetan, added to the Athenian, and Phigaleian marbles which we possess in the British Museum, would have formed a complete specimen of Grecian sculpture, as applied to the decoration of temples. The Museum has not even a set of casts of the Ægina marbles, the only one in England accessible to the public being deposited in the Royal Institution at Liverpool. Even the Academy of the Fine Arts at Venice possesses a set of these casts, which the metropolis of the British empire is without.

ÆGINETAN STYLE OF ART. Several ancient writers, particularly Pliny and Pausanias, make frequent mention of Æginetan works of art; and in such a manner, as to show that the productions of the school of Ægina, to use a modern and well-understood phrase, were highly esteemed. Many names of Æginetan sculptors had thus come down to us as almost synonymous with excellence in their art, but the works of none of these could be recognized among those which had escaped the ravages of time and the desolation of barbarism; so that their merits and reputation rested on report alone. The discovery of the sculptures which adorned the tympana of the Panhellenium, the national temple of the Æginetans, has furnished us with undoubted specimens of Æginetan art, and of that period too, as some suppose, in which the most celebrated Æginetan sculptors flourished. The latter conclusion has, we think, been too hastily adopted. That the sculptures of the Panhellenium are of great beauty and merit, and are for many reasons highly interesting, will be admitted by all; but that they are of the class and date from which the school of Ægina derived its celebrity, may fairly be doubted.

These principally consist of perfect statues, or statues in the round as they are termed, somewhat smaller than life, of men armed with spears, swords, shields, and bows; the bowmen have quivers of arrows suspended from their waists; most of the figures are helmed or bonneted, some with greaves on the legs, and two or three with armour on the body, or close-fitting garments on the body and limbs; but for the most part they are naked, except the head, and all are either engaged in active combat or have fallen from the effect of wounds. Besides the male combatants, one helmed and draped female figure, with a spear and a shield in her hands, and the helmed head of another, evidently belonged to the groups. These were all so distributed on the ground with reference to the temple, and are of such peculiar attitudes with respect to one another, and to the places they occupied, that there appears to have been no great difficulty in determining their original arrangement in groups, after the fragments into which many of the figures were broken, were once brought together; especially as the frames which inclosed the pictures they formed, were otherwise determinable, and thus assisted materially in fixing the relative positions of the parts composing the groups. Thus, the perfect female figure, evidently a statue of Minerva, standing upright and in full face, occupied the central position under the highest part of the tympanum of the western pediment; and the combating warriors of that end arranged themselves on her right and left, in attitudes upright and advancing, kneeling, stooping and falling, until the inner acute angles terminated in the wounded and recumbent. The goddess stands in quiet dignity, prepared, nevertheless, for action, while the battle, of which she appears to be the umpire, rages around her. Of this picture or group, the arrangement is so fitting and complete, and the action so perfect, that there is no reason to think, that any essential portion of it is undiscovered. But unfortunately it is not so with the group of the eastern or principal front; a few only of these figures can be restored, and it is only from the analogy afforded by the western group, that their arrangement can be aptly determined. As far as the figures can be made out, the persons seem to be nearly, if not quite, identical, and another period of the same action appears to be represented. The helmed female head is that of Minerva again, and Mr. Cockerell restores her figure as in the act of raising her spear and extending her vest, as if to stop the contest, or to protect the fallen. The exact subject, or subjects intended by these groups, is not known; though all the critics who have offered opinions seem to agree that they represent some actions of the distinguished Æginetan family of heroes, the Æacidæ, or descendants of Æacus, the mythological founder of the nation. Colonel Leake's opinion, as given by Mr Cockerell, *Journal of Science and the Arts*, [No. 12, p. 334—Note] is that they represent two periods in the contest over the body of Patroclus, from the Iliad, in which Ajax (one of the Æacidæ) and Hector were the principal combatants. That something connected with the Trojan war is intended, seems very evident, from the Phrygian bonnet worn by one of the warriors; and the greaves on the legs of those who may be supposed to be Greeks, in the eastern group, especially, and the absence of this covering on the figures of the opposite party, seem to intimate clearly that some national difference is intended. Thiersch's opinion is, that the group on the eastern pediment represents the expedition of Telamon, the son of Æacus, and Hercules, against Laomedon, king of Troy. The archer he considers to be the representation of

Hercules. The other group, he thinks, may represent the death of Achilles, and the struggles of Ajax to save his body from the Trojans. (See Thiersch's *History of Greek Sculpture*, p. 249, note.)

There is nothing in the combination of sculpture and architecture more admirable than the manner in which the various actions and attitudes, in the more perfect group of the figures, have been adapted to the situations which they occupied; and this too, without the slightest appearance of constraint; they are all natural and graceful, and in perfect keeping with the design of the subject, and the character of the architecture. The energy of action, the grace of attitude, and the truth of proportion displayed in these works, are also admirable, and the expression of many of the figures is excellent. Nevertheless, there is a degree of dryness and rigidity observable in the bodies and limbs, which give the works an archaic character, whilst the countenances, the hair, and the draperies, clearly betoken their near approach to, if not absolute connexion with, the archaic period. The faces are entirely devoid of expression, the hair is formally laid in tiers with convoluted ends, and the draperies, though not devoid of grace, are heavy and monotonous: to use the words of the writer before referred to in the *Journal of Science and the Arts*, p. 340, describing the sculptures,—'A smile is seen on all the mouths, the cheeks are rather hollowed, the lips are thick, the nose is short but angular and prominent; the eyes are protruded, the forehead is flat and retiring, and the chin is remarkably long and rather pointed; the hair and drapery are arranged with the greatest precision.' Now these are peculiarities which could not have existed in the works of men whose names are mentioned with those of Phidias and his compeers and immediate successors; but they clearly mark a more remote period. Nevertheless the comparative fulness of form, and freedom of action of the bodies and limbs, equally indicate a date not far removed from excellence.

To the period when the archaic era was passing into that which succeeded it, and not to the perfection of the latter, we must then refer the Panhellenian sculptures; they are to the more advanced works of the Grecian schools what the works of Giotto, Cimabue, Ghirlandaio, Pietro Perugino, Giovanni Bellino, and others, are to the perfection of the art of painting under Michael Angelo, Raphael, and Titian. No one in describing the schools of Florence, Rome, and Venice, would make reference to the simple and beautiful, but still imperfect works of the earlier, but to the almost perfect productions of the latter masters; nor would Pliny and Pausanias refer to the archaic sculptures of the Panhellenium as the best specimens of the school of Ægina, but to such works as could be classed with the sculptures of the Parthenon, and many of the statues and busts which now adorn the galleries of the Vatican and the Capitol, or are distributed among the various European capitals.

ÆLFRIC, an eminent Saxon prelate. He is said to have been the son of an Earl of Kent, but at an early age he embraced a devotional life, and assumed the habit of the Benedictines, in the monastery of Abingdon. In 963, when Athelwold, the abbot of that house, became Bishop of Winchester, he took Ælfric along with him, and made him one of the priests of his cathedral. Here he remained till 987, when he removed to Cerne Abbey. Next year he was made Abbot of St. Alban's, and soon after was promoted to the Bishopric of Wilton. Finally, in 994, he was translated to the Archbishopric of Canterbury, over which see he presided with great ability till his death, on the 16th of November, 1005. Ælfric was one of the most learned ecclesiastics of that age, and distinguished himself, throughout his life, by a very praiseworthy zeal and activity in the diffusion of knowledge. The following are the principal works which have been attributed to him: 1. A Latin and Saxon Glossary, printed by Somner at Oxford, in 1659: 2. A Saxon translation of most of the historical books of the Old Testament, part of which was printed at Oxford, in 1698: 3. A charge to his clergy, in articles, commonly called his Canons, which was published, by Spelman, in the first volume of his *English Councils*: 4. Two volumes of Saxon Homilies, translated from the Latin fathers: and 5. A Saxon Grammar in Latin. There were, however, other Saxon ecclesiastics of his name, and it has been doubted if all the works enumerated were the productions of the Archbishop of Canterbury.

ÆGINHARD. [See Eginhard.]

ÆGYPT. [See Egypt.]

Æ'LIA CAPITOLI'NA, a name given to Jerusalem in the time of the Emperor Hadrian, who, finding the Jews very restless and unruly subjects, treated them as revolted people, and took possession of the capital, Jerusalem, from which the Jews were excluded under pain of death. Some Roman colonists were sent to Jerusalem, which received the name of Ælia Capitolina; Ælia, from Ælius, one of the names of Hadrian; and Capitolinus, from the temple of Jupiter Capitolinus, which was built on, or near, the Holy Mount.

The history of all this transaction is very obscure. It would seem, according to some opinions, that the attempt to establish a Roman colony in Jerusalem, and the introduction of heathen rites into the city, was the *cause* of the disturbances which led the emperor to treat Jerusalem as a conquered city. The founding of a new town, and the desecration of the holy places, led, probably, to the wars in which Barchochebas headed the Jews, and which were as destructive to the nation as their former resistance to Titus. The name of Ælia Capitolina continued in common use among the Greeks and Romans till the time of the Christian Emperors. [See Mannert, *Syrien*. p. 216. Schlosser, *Universal History*, vol. iii. part 1.] Several coins of Hadrian still exist, which refer to the colony established by the Emperor. They bear on one side the head of Hadrian, and on the other, a Jupiter seated between two figures, or an eagle perched upon a thunder-bolt, with an inscription, Col. Ael. Cap. (See Vallant's *Numismata*.)

ÆLIA'NUS, CLAU'DIUS, a Roman citizen and a native of Præneste (Palestrina), probably lived about the middle of the third century of the Christian era. Like Cicero, Atticus, and many other Romans, he made himself so completely master of the Greek language, as to write it with ease and correctness. There is extant a work of his in fourteen books, entitled, *Various or Miscellaneous History*, which is a compilation or collection of extracts made by the author in his extensive reading. This work may be considered as one of the earliest collections of Ana. The value of it does not consist in what the compiler has written, but in the passages of lost writers that he has been the means of preserving. An edition of this work was published at Paris in 1805, 8vo. with Heraclides of Pontus and Nicolaus of Damascus, by the learned Greek *Coray*. There is a French translation of Ælian's work, by M. B. T. Dacier, Paris, 1772, 8vo. with notes.

Another work of Ælian's, in sixteen books, also written in Greek, is entitled *On the Peculiarities of Animals*. Though the author cannot claim the merit of being a scientific naturalist, like Aristotle, he has preserved to us in this work a number of curious facts, which he had collected from such works as he had read. Each of the sixteen books is subdivided into small chapters or sections, like the Miscellaneous History. Some critics are of opinion that the two works belong to different authors. [Schoell, vol. ii. *Greek Lit.*] J. G. Schneider published an edition of the work on animals in 1784; but the latest edition of the Greek text is by F. Jacobs, *Jena*. We are not aware that there is any English translation of this work. There are also twenty Greek letters extant attributed to a person of the name of Ælian.

ÆLIA'NUS, another person of this name, wrote a book on Tactics, which he dedicated to the Emperor Hadrian. There are several editions and translations of this work. A German translation, by A. H. Baumgärtner, appeared in his complete collection of the Greek writers on military tactics, *Frankenthal* and *Mannheim*, 1779, 4to. There is a French translation by B. de Bussy, Paris, 1757, 2 vols. 12mo. [*Schoell.*]

ÆMI'LII, the name of a patrician gens or clan in ancient Rome, who pretended to derive their origin from Mamercus, the son of Pythagoras. Of the different families included in this gens, the most distinguished were the Pauli, or Paulli, the Lepidi, and the Scauri. [For the two latter, see Lepidus and Scaurus.] Among the Paulli, the most worthy of notice was Lucius Æmilius Paullus, the son of the consul bearing the same name, who fell in the battle near Cannæ (B. C. 216), after using his utmost efforts to check the rashness of his colleague. Young Æmilius was a mere boy at the death of his father, yet by his personal merits, and the powerful influence of his friends, he eventually attained to the highest honours in his country. His sister Æmilia was married to Publius Cornelius Scipio, the conqueror of Hannibal, who was consul for the second time, B. C. 194; and this very year Æmilius, though he had held no public office, was appointed one of three commissioners to conduct a colony to Croton, in the south of Italy, a city with which he might claim some connexion on the ground of his descent from the Pythagoreans. Two years after, at the age of about thirty-six, he was elected a curule ædile in preference, if we may believe Plutarch, to twelve candidates of such merit that every one of them became afterwards consuls. His ædileship was distinguished by many improvements in the city and neighbourhood of Rome. The following year (191 B.C.) he held the office of prætor, and, in that capacity, was governor of the south-western part of the Spanish peninsula, with a considerable force under his command. The appointment was renewed the following year, but with enlarged powers, for he now bore the title of proconsul, and was accompanied by double the usual number of lictors. In an engagement, however, with the Lusitani, 6000 of his men were cut to pieces, and the rest only saved behind the works of the camp. But this disgrace was retrieved in the third year of his government by a signal defeat of the enemy, in which 18,000 of their men were left upon the field. For this success a public thanksgiving was voted by the senate in honour of Æmilius. Soon after, he returned to Rome, and found that he had been appointed, in his absence, one of the ten commissioners for regulating affairs in that part of western Asia which had lately been wrested by the two Scipios from Antiochus the Great. Æmilius was a member also of the college of augurs from an early age, but we do not find any means of fixing the period of his election. As a candidate for the consulship he met with repeated repulses, and only attained that honour in 182 B.C., nine years after holding the office of prætor. During this and the following year he commanded an army in Liguria, and succeeded in the complete reduction of a powerful people called the Ingauni (who have left their name in the maritime town of Albenga, formerly Albium Ingaunum). A public thanksgiving of three days was immediately voted, and, on his return to Rome, he had the honour of a triumph. For the next ten years we lose sight of Æmilius, and at the end of this period he is only mentioned as being selected by the inhabitants of Farther Spain to protect their interests at Rome, an honour which at once proved and added to his influence. It was at this period (171) that the last Macedonian war commenced, and though the Romans could scarcely have anticipated a struggle from Perseus, who inherited from his father only the shattered remains of the great Macedonian monarchy, yet three consuls, in three successive years, were more than baffled by his arms. In 168 a second consulship, and with it the command against Perseus, was entrusted to Æmilius. He was now at least sixty years of age, but he was supported by two sons and two sons-in-law, who possessed both vigour and ability. By Papiria, a lady belonging to one of the first families in Rome, he had two sons and three daughters. Of the sons, the elder had been adopted into the house of the Fabii by the celebrated opponent of Hannibal, and, consequently, bore the name of Quintus Fabius Maximus, with the addition of Æmilianus, to mark his original connexion with the house of the Æmilii. The younger, only seventeen years of age at this period, had been adopted by his own cousin, the son of Scipio Africanus, and was now called by the same name as his grandfather by adoption, viz., P. Cornelius Scipio, with the addition of Æmilianus, as in his brother's case. The careless reader of Roman history often confounds these two persons, and the more so, as the younger also eventually acquired the same title of Africanus. By the marriage of his daughters again, Æmilius was father-in-law to Marcus Porcius Cato, son of the censor, and to Ælius Tubero. These four young men accompanied Æmilius to the war in Macedonia, and all contributed in a marked manner to his success. Perseus was strongly posted in the range of Olympus to defend the passes from Perrhæbia into Macedonia, but he allowed himself to be outmanœuvred. Æmilius made good his passage through the mountains, and the two armies were soon in view of each other near Pydna. On the evening before the battle, an officer in the Roman army, named Sulpicius, obtained the consul's permission to address the troops upon a point which was of no little importance in those ages. An eclipse of the moon, it was known to Sulpicius, would occur that night, and he thought it prudent to prepare the soldiers for it. When the eventful moment arrived, the soldiers went out indeed to assist the moon in her labours with the usual clamour of their kettles and pans, nor omitted to offer her the light of their torches; but the scene was one of amusement rather than fear. In the Macedonian camp, on the other hand, superstition produced the usual effect of horror and alarm; and on the following day the result of the battle corresponded to the feelings of the night. In a single hour the hopes of Perseus were destroyed for ever. The monarch fled with scarcely a companion, and on the third day reached Amphipolis. Thence he proceeded to Samothrace, where he soon after fell into the hands of the conqueror. The date of the battle of Pydna has been fixed by the eclipse to the 22d of June. Livy, indeed, assigns it to a day in the early part of September; but it is not impossible that the difference may be owing to some irregularity in the Roman calendar, which, prior to the Julian correction, must often have differed widely from the present distribution of the year. The Romans were careful in recording the day of every important battle. After reducing Macedonia to the form of a Roman province, Æmilius proceeded on his return to Epirus. Here, under the order of the senate, he treacherously surprised seventy towns, and delivered up to his army 150,000 of the inhabitants as slaves, and all their property as plunder. On his arrival in Rome, however, he found in this army, with whom he was far from popular, the chief opponents of his claim to a triumph. This honour he at last obtained, and Perseus with his young children, some of them too young to be sensible of their situation, were paraded for three successive days through the streets of Rome. But the triumphant general had a severe lesson from affliction in the midst of his honour. Of two sons by a second wife, (he had long divorced Papiria,) one aged twelve died five days before the triumph, the other, aged fourteen, a few days after; so that he had now no son to hand down his name to posterity. Æmilius lived eight years after his victory over Perseus, in which period we need only mention his censorship, B.C. 164. At his death, 160 B.C., his two sons, who had been adopted into other families, Fabius and Scipio, honoured his memory in the Roman fashion by the exhibition of funeral games; and the Adelphi of Terence, the last comedy the poet wrote, was first presented to the Roman public on this occasion. The fact is attested by the inscription still prefixed to the play. Æmilius found in his grateful friend Polybius one willing and able to commemorate, perhaps to exaggerate, his virtues. Few Romans have received so favourable a character from history. (See Polybius, Livy, Plutarch.)

ÆNE'AS, a Trojan prince of the royal blood, son of Anchises and Venus. According to Homer he commanded the Dardanians; and his name occurs frequently in the Iliad, but not in the first rank of heroes. He owes his celebrity to those stories which make him the reputed founder of the Roman empire in Italy, and to his being the hero of Virgil's poem. According to the Latin poets, on the night when Troy was taken, or, as others say, before its capture, Æneas quitted the city, bearing on his shoulders his aged father, and the images of his household gods; accompanied by his wife Creusa, who perished by the way, and his son Iulus, also called Ascanius. The older authors do not speak of the multitude of followers and number of ships with which Virgil has adorned his narrative. According to them he quitted the Trojan shores in a single ship to seek his fortune in the unknown regions of the west. After many wanderings he reached the coast of Latium with one hundred followers, and was favourably received by Latinus, king of the country, who assigned a small tract of ground as a settlement for the Trojans. But war soon broke out between the strangers and the natives. Turnus, prince of the Rutuli, joined Latinus to expel the foreigners; but the allied princes were defeated, and Latinus was slain in the first battle. Lavinia, his daughter, became the bride of the victor, and the citadel of Laurentum fell into his hands. Æneas now built the city of Lavinium, which was hardly completed, when Turnus again appeared in arms, assisted by Mezentius, king of Cære. Another battle ensued, in which Turnus fell; but the Latins were defeated, and Æneas was drowned, or at least disappeared, in the river Numicius. He was afterwards adored as Jupiter Indiges: a temple was raised to him on the bank of the river; and the Latins, and in later ages, the consuls of Rome, offered yearly sacrifices to him under that name. Iulus, his son by Creusa, succeeded to the throne, and founded a city, celebrated in the history of Latium, called Alba Longa. He was succeeded by Sylvius, son of Æneas and Lavinia, from whom a long line of Latin kings descended. Iulus, however, left progeny, though their claims seem to have been set aside in consequence of the maternal title of Sylvius:

since the Julian family, and among them the imperial house of Cæsar, boasted their descent from the former. Such is a sketch of the chief traditions about this reputed Trojan prince and his settlement in Italy. [See Niebuhr's *Roman History*, vol. i., p. 176. Hare and Thirlwall's translation.]

The only allusion in Homer to the history of Æneas after the Trojan war is, a prediction that he and his children shall reign for centuries over the Trojans: nothing is said of the place of their settlement. Some have supposed that he remained in the Troad, and that the story of his emigrating to Italy is entirely destitute of foundation.

Æ'NEID. The most celebrated epic poem of antiquity, after the Iliad and Odyssey. It was written by Virgil in the time of Augustus Cæsar; and relates the wanderings of Æneas after the siege of Troy; his arrival in Italy, and his adventures previous to his marriage with Lavinia, with his final establishment in Latium. The poem, however, does not carry its hero so far as this, but closes with a single combat between Æneas and Turnus, and the death of the latter. In some respects Virgil has deviated from the legend related in the article Æneas. He has multiplied the Trojan ships and increased the number of the Trojans; he has carried his hero to Carthage, though we do not know whether Carthage existed at the supposed date of Æneas' wanderings; he has made the death of Turnus precede the marriage of Æneas and the foundation of Lavinium, and has allowed Latinus to survive, instead of making his daughter wed the author of her father's death. The poem consists of twelve books, of which the six first are occupied in relating the wanderings of Æneas, and seem to be modelled on the Odyssey; the six last contain his descent into Italy, and the war which ensued between the Trojans and the natives, and seem to be modelled on the Iliad. In the minute details of ornament as well as in the general notions of his work, Virgil has borrowed largely from Homer. This poem was written later than his other works, the Eclogues and Georgics. It was commenced about the year A.U.C. 724, or B.C. 30; and the author continued to labour on it till his death, in B.C. 20; at which time he was so little satisfied with the state of his production that, it is said, he gave earnest injunctions on his death-bed that it should be burnt, as too imperfect to advance his fame. The order was not fulfilled, at the desire of Augustus, who intrusted the publication to two learned friends of the author, Tucca and Varus. Many lines are left imperfect; some suppose this to be one proof that the finishing hand of the master was never applied; but we doubt whether it is, and think it possible that they were purposely left so. It called forth the enthusiastic admiration of his contemporaries. Propertius wrote—

> Yield, Roman poets; lords of Greece, give way;
> The Iliad soon shall own a greater lay;

and some writers, even in modern times, have expressed the same opinion. The merits of these poets will be better discussed under their respective names. It is enough to say that, compared with the Iliad, the Æneid is wanting in originality and power: it is evidently the laboured performance of a learned man, possessed of an elegant mind, who has availed himself freely of the labours of those who have preceded him. Virgil is characterized by Niebuhr as possessing 'a genius barren for creating, great as was his talent for embellishing.' The characters of the Æneid are deficient in the individuality and freshness which mark the descriptions of those who have mingled in scenes, and been familiar with characters such as they portray. The brave Gyas, and the brave Cloanthus are hardly distinguishable, except by name: Achates, the friend of Æneas, is a mere shadow, always attending on his chief; and, indeed, with the exception of Dido, no character is well defined. Æneas himself, though the hero of the poem, neither excites any strong interest nor leaves any powerful impression. In this respect Virgil is immeasurably inferior to Homer. The former, from his own imagination, or from the writings of older authors, had to create characters and describe manners such as he had never seen; the latter was familiar with men and actions such as he described them, or at least he embodied the vivid traditions of an early and poetical age. The strength of Virgil lay in the pathetic rather than in the sublime; and many passages of the Æneid, which admitted of the former quality, are exquisitely beautiful.

The Æneid has been frequently translated into most European languages. In our own, we may notice one peculiarly interesting to the literary antiquary; a translation, by Gawin Douglas, bishop of Dunkeld, of the whole Æneid into the old Scottish dialect, about 1512; and said by Mr. Warton to be the first translation of a classic into the language of Britain. The Earl of Surrey translated the second and fourth books, printed in 1577. There are complete translations by Ogilby, Pitt, &c., but the energetic version of Dryden has nearly superseded all others.

ÆNI'GMA, a Greek term for what is commonly called a riddle. It is the description of a thing by certain of its qualities selected and disposed, with the object of hiding what the thing is, and of occasioning its discovery to come as a surprise.

An ænigma differs from a definition or other direct statement, not in being false, but only in being obscure and misleading. The one is an instance of the application of language to make known our thoughts, and the other of its application to the purpose of concealing them: but the words of a good ænigma, when properly understood, are as true as those of a good definition. It is also an indispensable quality of the latter, as well as of the former, that it shall be intelligible, in its whole import, only in one sense.

The object of a direct statement is to convey information; that of an ænigma is to exercise the ingenuity. The former, in its simplest and most legitimate form, has only to be *received* by the mind; the latter demands to be *solved.* An ænigma, therefore, may be regarded as one of the complex or ornamented modes of composition, that is to say, one of those which do not merely appeal to the apprehension, but excite and gratify other intellectual faculties.

In very ancient times, accordingly, the ænigma was a common and favourite medium for the conveyance even of truths of the highest importance. Formal composition in the earliest state of society, that it might be the better distinguished from ordinary speech, naturally affected an elaborately artificial character; and the ænigma or riddle presented itself among other devices for that end. It had, besides, the peculiar recommendation of giving an air of mystery to the sentiment which it involved, and so making it seem to be something still more remote than it might really be from common experience and speculation. The term ænigma, indeed, was probably used originally to describe any short composition, such as an apologue, or fable, or other portable sample of wisdom or entertainment. Ænigma is something *dark* and *obscure*, and the corresponding verb (*αἰνίττεσθαι*) always means to speak *ænigmatically*, according to our meaning of the word, or to speak with a certain degree of mystery and obscurity.

In the progress of civilization and literature, it came to be felt that obscurity and difficulty were qualities, which, whatever pleasure they might convey to those who tried to master them, were inconsistent with all the higher and more appropriate objects of speaking and writing. Whether the purpose be simply to communicate information, or whether it be to appeal also to the imagination and the passions, a style is good exactly in proportion as it is expressive, that is to say, as it conveys directly and completely the thoughts of the writer or speaker. The ænigma, therefore, the very end and nature of which is the reverse of this, instead of being an ornament, must be regarded as one of the worst faults of style. Whatever *approaches* towards the ænigmatical, is, for the same reason, a fault in writing—whatever figure, for example, is introduced in poetry or rhetoric more in order to surprise the reader by its ingenuity than for any other purpose. Amongst those writers who have vitiated their works by what may be called an ænigmatic turn of phraseology, Young is an instance, in his *Night Thoughts.*

ÆO'LIAN HARP, a musical instrument, the sounds of which are drawn from it by a current of air acting on the strings; hence it is named after *Æolus*, to whom in the heathen mythology is given the command of the winds.

Rather before the middle of the last century, the Æolian Harp was brought forward in London as a newly-invented instrument; and Dr. Anderson, in a note to Thomson's *Ode on Æolus's Harp*, ascribes the invention of it to Mr. Oswald, (the composer of Scottish songs, we presume,) adding, 'its properties are fully described in *The Castle of Indolence.*' However, it is possible that an instrument of the kind was very anciently known, for the Talmudists say that the *Kinnor*, or harp of David, sounded of itself when the north wind blew on it. But the merit of the invention in the form it now takes, is due to Athanasius Kircher, who, in his *Musurgia Universalis*, (lib. ix. 352,) thus describes it: 'As the instrument is new, so also is it pleasant and easy to construct, and is heard in my museum to the admiration of every one. It is silent as long as the window in which it is placed remains closed, but when this is opened, a sudden harmonious sound breaks forth which astonishes the hearers, for they neither perceive whence it proceeds, nor what kind of instrument is before them, for the sounds do not resemble those of a stringed or of a pneumatic instrument, but partake of both. The instrument is made of pine wood, is five palms long, (fifteen inches,) two broad, and one deep: it may contain fifteen or more strings, all equal, and of catgut. The method of tuning it is not, as in other instruments, by 3ds, 4ths, 5ths, &c., but all the strings are to be in unison or in octaves, and it is wonderful that such different harmony should be produced from strings thus tuned.'

A modern writer gives the following more detailed directions for the construction of the Æolian harp, and such as we know, from experiment, are better calculated to produce the intended effects. Let a box be made of as thin deal as possible, of a length exactly answering to the window in which it is intended to be placed, four or five inches in depth, and five or six in width. Glue on it, at the extremities of the top, two pieces of wainscot, about half an inch high and a quarter of an inch thick, to serve as bridges for the strings; and withinside, at each end, glue two pieces of beech about an inch square, and of length equal to the width of the box, which is to hold the pegs. Into one of these bridges fix as many pegs, such as are used in a pianoforte, though not so large, as there are to be strings; and into the other, fasten as many small brass pins, to which attach one end of the strings. Then string the instrument with small catgut, or *first* fiddle-strings, fixing one end of them, and twisting the other round the opposite peg. These strings, which should not be drawn tight, must be tuned in unison. To procure a proper passage for the wind, a thin board, supported by four pegs, is placed over the strings, at about three inches distance from the sounding-board. The instrument must be exposed to the wind at a window partly open; and to increase the force of the current of air, either the door of the room, or an opposite window, should be opened. When the wind blows, the strings begin to sound in unison; but as the force of the current increases, the sound changes into a pleasing admixture of all the notes of the diatonic scale, ascending and descending, and these often unite in the most delightful harmonic combinations, producing

"A certain music, never known before,"

says Thomson, in his *Castle of Indolence*, who goes on describing the instrument as one

"From which, with airy fingers light,
Beyond each mortal touch the most refined,
The God of Winds *draws* sounds of deep delight;
Whence, with just cause, the harp of Æolus it hight.
Ah me! what hand can touch the string so fine?
Who up the lofty diapason roll
Such sweet, such sad, such solemn airs divine,
Then let them down into the soul?

* * * * *

Wild-warbling nature all, above the reach of art!"

The learned Matthew Young, B.D., formerly of Trinity College, Dublin, has entered deeply into the nature of the Æolian harp, in his *Enquiry into the principal Phænomena of Sounds*, &c., and as his work is rare, we shall here avail ourselves of his remarks on this subject:—

'The phænomena of the Æolian lyre may be accounted for on principles analogous to those by which the phænomena of sympathetic tones are explained.' [See Sympathetic Sounds.] 'To remove all uncertainty in the order of the notes in the lyre, I took off all the strings but one, and on placing the instrument in a due position, was surprised to hear a great variety of notes, and frequently such as were not produced by any aliquot part of the strings: often, too, I heard a chord of two or three notes from this single string. From observing these phænomena, they appeared to me so very complex and extraordinary, that I despaired of being able to account for them on the principle of aliquot parts. However, on a more minute enquiry, they all appear to flow from it naturally and with ease.

'But let us consider what will be the effect of a current of air rushing against a stretched elastic fibre. The particles which strike against the middle point of the string will move the whole string from its rectilineal position; and as no blast continues exactly of the same strength for any considerable time, although it be able to remove the string from its rectilineal position, yet, unless it be too rapid and violent, it will not be able to keep it bent: the fibre will, therefore, by its elasticity, return to its former position; and, by its increased velocity, pass it on to the other side, and so continue to vibrate and excite pulses in the air, which will produce the tone of the entire string. But if the current of air be too strong and rapid, when the string is bent from the rectilineal position, it will not be able to recover it, but will continue bent and bellying like the cordage of a ship in a brisk gale. However, though the whole string cannot perform its vibrations, the subordinate aliquot parts may, which will be of different lengths in different cases, according to the rapidity of the blast. Thus when the velocity of the current of air increases, so as to prevent the vibration of the whole string, those particles which strike against the middle points of the halves of the string, agitate those halves as in the case of sympathetic and secondary tones; and as these halves vibrate in half the time of the whole string, though the blast may be too rapid to admit of the vibration of the whole, yet it can have no more effect in preventing the motion of the halves, than it would have on the whole string were its tension quadruple; for the times of vibration in strings of different lengths, and agreeing in other circumstances, are directly as the lengths; and in strings differing in tensions, and agreeing in other circumstances, inversely as the square roots of the tensions. and, therefore, their vibrations may become strong enough to excite such pulses as will affect the drum of the ear; and the like may be said of other aliquot divisions of the string. In the same manner as standing corn is bent by a blast of wind, and if the wind be sufficiently rapid, it will have repeated its blast before the stem of corn can recover its perpendicular position, and therefore will keep it bent. But if it decays in rapidity or strength, the stem of corn will have time to perform a vibration before it is again impelled; and thus it will appear to wave backwards and forwards by the impulse of the wind. Those particles which strike against such points of the string as are not in the middle of the aliquot parts, will interrupt and counteract each other's vibrations, as in the case of sympathetic and secondary tones, and, therefore, will not produce a sensible effect.' With regard to those notes which cannot be produced by any exact submultiple of the string, but which, notwithstanding, are sometimes heard on the Æolian harp, Mr. Young observed that they were always transitory, gradually rising or falling to such notes, above or below them, as would be produced by exact aliquot parts of the whole string.

Mr. Young follows the principles here laid down, by a series of experiments, which are of a very satisfactory nature, but for these we must refer the reader to the work itself.

ÆO'LIAN ISLANDS, the ancient name of the eleven small islands north of Sicily, now generally called the Lipari Islands.

ÆO'LIAN MODE, in ancient music, one of the five principal modes of the Greeks, which derived its name, not from the Æolian isles, but from Æolia, a country of Asia Minor. What this mode was, it is now difficult, if not impossible, to determine. Writers of all times and kinds differ most essentially from each other on the subject. Rousseau says it was grave: the Abbé Feytou contradicts him. Sir F. Stiles tells us that this mode was the same as our E flat: Dr. Burney makes it F minor; and Rousseau says F, meaning, of course, F major. See Mode.

ÆO'LIANS, the name of one of those various peoples, whom we are accustomed to class under the general appellation of Greeks. We trace the name of Æolians to Thessaly, their primitive abode, as far as we know, where they appear to have been closely related to the Phthiotic Achæans of the same country. What was the nature of their relationship to the Dorians who dwelt successively in Phthia, Olympus, Pindus, Dryopis and the Peloponnesus, we cannot determine; but undoubtedly their languages were very closely allied. The Achæi of the Peloponnesus (the Achæi of Homer) were also kinsmen, and, in fact, part of the Æolians; and the great emigration, commonly called the Æolian, was an emigration of Achæan people. It seems probable that the emigration from the Peloponnesus commenced before the Dorian invasion, or return of the Heraclidæ, as it is often called, which caused so great a revolution in the Peninsula; but it cannot be doubted that this event contributed still further to the Achæan or Æolian emigration under Penthilus the son of Orestes, and others of Agamemnon's descendants. This great revolution in the Peloponnesus, caused by an invasion of hardy mountaineers and conquerors from Northern Greece, took place, as the best-informed Greek historians believed, eighty years after the war of Troy, or B.C. 1104; and apparently caused a retrogression in the condition of southern Greece, and drove out a more civilized race. Strabo says that the Æolian settlements in Asia were four generations prior to those called the Ionian. The Æolian colonies on the Asiatic main land were widely spread, extending at least from Cyzicus along the shores of the Hellespont and the Ægean to the river Caicus, and even the Hermus. Many positions in the interior were also occupied by them, as well as the fine island of Lesbos, with Tenedos, and others of smaller importance. Homer mentions all these parts as possessed by a different people; which would be a proof, if any were wanting, that the race of new settlers came after his time. There were twelve cities or states included in the older settlements in that tract of Asia Minor on the Ægean, which was known in Greek geography by the name of Æolis, and formed a part of the subsequent larger division of Mysia. Smyrna, one of them, which early fell into the hands of the Ionians, the neighbours of the Æolians, still exists nearly on the old spot, with exactly the same name, thus adding one to the many instances of the durable impression made by Greek colonists wherever they settled.

But besides these twelve states, to which we have alluded, (most of which were near the coast,) there were many Æolian towns founded by the new comers along the Hellespont, the range of the Ida mountains, and on the coast of Thrace.

The name Æolic is often applied to a branch or dialect of the Greek language; but as we do not possess any entire work written in this dialect, we cannot satisfactorily compare it with the Attic, or that variety of the Greek language in which the tragedies of Æschylus, Sophocles, and Euripides, the histories of Thucydides and Xenophon, and the orations of Æschines and Demosthenes are written. There is no doubt, however, that it approached nearest to the Doric dialect of the Greek language, such as it was spoken in most parts of the Peloponnesus after the great Dorian invasion already mentioned.

ÆOLIPYLE, ÆOLIPILE, *Aeoli pila, the ball of Æolus*, an instrument made use of formerly in experimenting, consisting of a hollow ball, with a small orifice in which a tube might be screwed. It served to boil water in, for the purpose of creating steam. This instrument is mentioned by Des Cartes, in his treatise on *Meteors*, chap. iv., as used in his time. It is now entirely out of use, unless we choose to consider the boiler of a steam-engine as an æolipile. This is by no means the first instance in which a philosophical toy has been made of use to the arts.

ÆRA, a point of time from which *subsequent* years are counted, and in some instances *preceding* years, as in the Christian æra. The origin of the word *æra* is very doubtful.

All nations who have any history to record have fixed their æra at some remote period, in order to embrace in their annals as large an extent of time as practicable. The creation of the world would most naturally present itself to those who might have any means of ascertaining the time of its occurrence, and the Bible would be the source from whence the information might be obtained. But, unfortunately for chronology, the Bible is not sufficiently explicit on this subject; and, although the Jews and some Christian nations do date from the Creation, their computations of the period at which this event took place differ to the extent of nearly two thousand years. Those whom this uncertainty has deterred, or who have had no knowledge of the Scriptures, have contented themselves with more recent periods. The ancient Romans adopted the epoch of their first supposed political existence, and the Greeks that of the first celebration or revival of the Olympic Games, which were with them an important national festival. Many nations have assumed some event closely connected with their religious faith: thus, the early Christians of the East dated from the persecution under the Emperor Diocletian, and those of Europe and America, at the present day, from the birth of Christ. All the followers of Mohammed have adopted, as an æra, the retreat of their prophet from Mecca to Medina, which they call the Hegira.

Many of these æras are arbitrarily and incorrectly fixed, and even our own is erroneous by four years. But an error at the commencement will not invalidate the dates of events recorded subsequently, as any æra once assumed will be sufficient to show the succession of time, however incorrectly assigned to the period whose name it bears.

With one or two exceptions, all nations have reckoned time in accordance with the course of the seasons; they have always begun their year at the same season, sometimes perhaps a little earlier, and sometimes later, but invariably keeping near the original commencement.

Here follows a list of the æras which have been or are most in use among the civilized nations of the world, with the year of the Christian æra in which they began:—

1. The year of the world according to the reckoning of Constantinople, which was used in Russia until the beginning of the eighteenth century, and is still employed by the Greek church - - - - - - - - - - - - - - B.C. 5509
2. The year of the world as reckoned at Antioch, now used in the Abyssinian church - - - B.C. 5492

[The church of Alexandria originally assumed the year B.C. 5502 as the year of the Creation, but in the year 285 A.D. they discarded ten years, and thus acceded to the computation of Antioch.]

3. The year of the world used by the Jews - - B.C. 3761
4. The Caliyuga, employed by the learned throughout India, may be called an æra of the Creation, being considered by the Hindoos as the commencement of the present state of the world, or 'Iron Age' - - - - - - - - B.C. 3102
5. The Olympiads; the æra of the victory of Corœbus at the Olympic games, used chiefly by the Greek historians after the age of Alexander - - - - - - - - - - - - - B.C. 776

[N.B. An Olympiad is a period of four years.]

6. The building of Rome: this is generally called the Varronian æra - - - - - - - - - - - B.C. 753
7. The Catonian æra of the building of Rome is* B.C. 752
8. The æra of Vicramaditya, in common use throughout India - - - - - - - - - - - B.C. 57
9. The Spanish æra, from the conquest of Spain by Augustus, was employed in Spain, Portugal, Africa, and the South of France. In some provinces this æra was in use until the middle of the fifteenth century - - - - - - B.C. 38
10. The æra of Salivahana, in common use through the southern and western states of India - - A.D. 78
11. The æra of Martyrs, or of Diocletian, so called from the persecution of the Christians in the reign of that emperor, was much used by the early Christians, and is still employed in the churches of the East - - - - - - - - - - A.D. 284
12. The Hegira, used by all Mohammedans, dates from the flight of Mohammed to Medina - - A.D. 622
13. The Christian æra dates from the birth of Christ; the year in which he was (erroneously) supposed to be born is called 1 B.C., the following year 1 A.D. Many authors call the year of our Lord's birth 0, and consequently make the dates of all preceding events one year less than by the common practice.

The following rules will serve to show the year of the Christian æra corresponding with that of any given æra:—

1. When the commencement of the given æra precedes the birth of Christ, subtract from the given year the number affixed to the æra in the above list, and the remainder will be the year of Christ in which the given year began.

If the given year be less than the affixed number, subtract it from that number, adding one; the result will be the date before Christ.

Examples.—Required the Christian date answering to the year of Rome 1754.

From 1754
Deduct 753

The year 1001 A.D. corresponds with the year 1754 A.U.C.

Required the year B.C. answering to 707 A.U.C.

From 753
Deduct 707

46
Add 1

The year 47 B.C. coincides with 707 A.U.C.

The reason is this: A.U.C. 707 means that an event took place *in* that year; and therefore 753—706 or 47 years B.C. remain, and as all the years B.C. *before* B.C. 47 have expired, the event must take place *in* the year B.C. 47.

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* See Ideler's *Chronology*, p. 334.

Required the year of Christ in which the year of the Jews 5591 began.

From 5591
Deduct 3761

Answer A.D. 1830

2. When the commencement of the given æra follows the birth of Christ, add to the given year the number affixed to the æra in the list, less one. The sum will be the year of Christ in which the given year began.

Example.—Required the Christian year in which 1031 of Martyrs began.

To the given year 1031
Add the number in the list less one 283

The year A.D. 1314 answers to the year 1031.

All the above dates may be reduced to the Christian æra by the same formula, except that of the Hegira, as the Mohammedans allow only 354 days to the year. Mohammedan reckoning is thus at variance with the course of the seasons; their year now begins in May, changes to March in 1840, and to December in 1850, and thus gains at the rate of a little more than three years in a century. It will, therefore, be necessary to prepare any given date from the Hegira by subtracting three years for every hundred, before reducing it to the Christian æra.

Required the year of the Hegira 1245
Subtract 3 years for every hundred 37

1208
Add the number in the list less one 621

1829

The year of the Hegira 1245 began in the year 1829 A.D.

3. The computation by Olympiads may be thus explained: for instance, Ol. lx.3 means that an event took place *in* the *third* year of the *sixtieth* Olympiad, and consequently *in* the year that followed the expiration of 59 Olympiads (or 59 periods of 4 years each), and 2 more years belonging to the sixtieth Olympiad; or after the expiration of 238 years, and therefore *in* the year B.C. 538.

AERIAL PERSPECTIVE, a term in painting, implies, in its simple definition, the receding of objects into distance, as seen through the medium of air. In its general application, however, it is to be understood in a more enlarged sense. Linear perspective may be considered the material guide of the artist, originating in, and governed by, mathematical science; but aërial perspective is, in whatever relates to *effect*, amenable to no positive law or established rule, and depends for its application on the perceptions and capacity of the artist. Although entering into every variety of subject, in graphic representation, it is in open scenery that aërial perspective is exhibited in its proper sphere. To feel this, it will only be necessary to recollect in how different an aspect the same scenery may present itself under different modifications of the atmosphere. A prospect, which at noon day, or in a clear and bleak morning, appears tame and uninteresting, shall assume an ideal character, and start into combinations of beauty, if seen at sunrise or at sunset, or under any temperature of the sky favourable to the development of picturesque effect.

It is, of course, in those schools of painting, wherein the study of external nature, especially of landscape, has been most cultivated, that we are to look for the finest examples of aërial perspective. The Roman and Florentine masters, whose object, almost exclusively, was human form and character, seem to have felt or understood but little of it. The Dutch and Flemish painters exhibit high excellence in this particular, as is shown in the works of Rubens, Rembrandt, Teniers, Ostade, Cuyp, Ruysdael, Wouvermans, Vanderveldt, &c. France, however, has the glory of having produced the artist Claude Lorraine, who, in this great quality of art, has borne off the palm from all competitors. He rarely painted any other effects than those of the rising or the setting sun, well knowing their picturesque superiority; but whatever be his subject, an ancient port, or ruins, or temples, the great and presiding charm of Claude is his consummate skill in aërial perspective. If there be any artist who, in the treatment of aërial perspective, can compete with Claude, that competitor, perhaps, is Cuyp. His pictures are direct portraits of the scene before him,—the willowy lake, the marsh, the meadow, the drowsy shepherd, and the ruminating cow. But, in spite of the simplicity of these materials, and an horizon, in general, perfectly flat, he communicates to his works an effect of air and distance, and consequently of reality, which must rank them among the most astonishing efforts of art. To these may be added a third, the English Wilson, whose breadth and brilliancy of style, and whose conspicuous mastery in the practice of aërial perspective, give him a right to rank with Claude and with Cuyp in this quality.

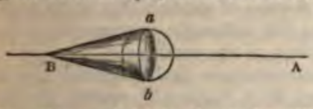
AERO-DYNAMICS, signifies the science which treats of the motion of the air, or of the mechanical effects of air put in motion. In its widest sense, it might be taken to include the effects of the motion of any gaseous substance or vapour; and even the properties of steam might be considered as a part of the science. We shall, however, confine ourselves to the explanation of the few general principles which can be relied upon; the applications of which will be found in the articles WIND, WINDMILL, AIR-GUN, SAIL, BELLOWS, RESISTANCE, GUNNERY, &c.

The air is an elastic fluid,—that is, any portion of it can be confined in a smaller, or expanded into a larger space, than it would naturally occupy. In either case a force or pressure is to be overcome; the air itself resists compression; and the pressure of the superincumbent air is to be overcome before any expansion can take place. The natural state of the air to which we have alluded, varies, as indicated by the rise or fall of the BAROMETER, which, at the level of the sea, is usually between twenty-eight and thirty-one inches in height, that is, the flat bottom of any vessel is pressed by a weight, arising from the air, such as would be obtained by filling it with mercury to a height of from twenty-eight to thirty-one inches. This pressure is estimated at from fourteen to fifteen pounds avoirdupois on every square inch. [See AIR.]

As soon as we begin to move, we feel, more or less, the resistance of the air. At an ordinary rate of motion, this is not very perceptible; but the jockey, who rides at the rate of from thirty to forty miles an hour, feels it sensibly, and is obliged to wear a cap which may *cut* the wind, as the bow of a ship *cuts* the water, or otherwise it would be blown off his head, though, in the common sense of the word, there might be no *wind* stirring at the time. Whenever we attempt to put any matter in motion, we feel what is denominated pressure or resistance, which is the greater the greater the quantity of matter we attempt to move, and the velocity we attempt to communicate to it. Thus, two violent pressures, of equal force, applied for an instant to weights of ten and twenty pounds, will make the weight of ten pounds move twice as fast as that of twenty; or, if we would have the two move equally fast, we must apply twice as much pressure to the twenty pounds weight as we do to that of ten pounds. If we now conceive a number of equal balls placed in a line, along which we move the hand uniformly, so as to set them all in motion one after the other, we might at first imagine that if we move the hand at the rate of two feet in a second, and afterwards at the rate of four feet in a second, that we exert twice as much force, and encounter twice as much resistance, in the second case, as in the first. Because, we say, we move each ball in the second case twice as fast as in the first. But there is another consideration: we not only move each ball twice as fast, but we meet with twice as many balls in a second, so that not only the velocity we communicate in a second is doubled, but also the quantity of matter to which we communicate that velocity is doubled, or, there is four times as much resistance to twice the velocity, as there was to the single velocity. Similarly, at three times the rate of motion, we meet with three times as much matter, and communicate to each portion three times the velocity: whence we meet with three times three, or nine times the quantity of resistance. If we transfer this reasoning to the case of a body moving through the air, we should infer, that the resistance is, to speak mathematically, as the SQUARE of the velocity: that is, if the velocity be suddenly made ten times as great, the resistance is made ten times ten, or a hundred times as great. And this, which was the first theory proposed on the subject, is sufficiently near the truth for practical purposes, when the velocities are not very great; for example, up to eight or nine hundred feet in a second.

But one circumstance has been neglected. The succes sive particles of air which the moving body strikes, instead of being moved out of the way completely, are forced upon those in front, so that there is a condensation of air before the moving body; which condensation, as we have seen in ACOUSTICS, is propagated onwards at the rate of about 1125 feet in a second. In the meanwhile, the space through which the body moves, or has moved, is, or has been, entirely cleared of air; and though the air is forced with great rapidity into the vacant space, yet this is not done instantaneously, as we shall presently see from experiment. Therefore though, when at rest, the atmospheric pressures before and behind the body counterbalance each other, yet when in motion, there is an increase of the pressure before the body, and a diminution of that behind it; both which circumstances increase the resistance.

From theory, tolerably well confirmed by experiment, it appears, that if air of the ordinary pressure be allowed to rush into a *vacuum*, or space entirely devoid of air, it will be driven in at first with a velocity of about 1340 feet per second; or, to avoid an appearance of accuracy of which we are not actually in possession, we may say between 1300 and 1400 feet per second. If now, instead of rushing into a vacuum, the air which comes through the orifice meets with other air of a less density, say one-fourth of its own density, the velocity above-mentioned will be diminished in the proportion of 1 to the square root of $1-\frac{1}{4}$, or of 1 to $\sqrt{\frac{3}{4}}$, or of 2 to $\sqrt{3}$, or of 100 to 87, very nearly. By a similar process any other case may be computed. Let us now imagine a ball, *a b*, made to move forward in the direction B A, with an initial velocity less than 1000 feet per second. Let B be the last point of its track at which the air has completely recovered its former state. The air in the cone B*a b* will not have entirely recovered its state, but will all be more or less rarefied; so that in addition to the loss of motion arising from communication to the particles of air, there is a part of the atmospheric pressure on the front of A B, uncounterbalanced from behind. The condensation in front of A B is propagated, as in ACOUSTICS, quicker than the ball moves; so that the air in front continues, if not entirely, at least very nearly, in its natural state. We cannot say that the cases of air rushing through an orifice into a vacuum, and filling up the space left by a ball, have any decided similarity; nor can we say the contrary, owing to the very imperfect state of the mathematical analysis of this part of the subject. We may, however, conjecture that when the ball moves with a velocity greater than that of sound, thereby condensing the air before it, and leaving a perfect vacuum behind it, or nearly so, the resistance will be much greater than the theory in the first part of this article would lead us to expect. And this proves to be the case at even less velocities than the one just specified; for though up to 1000 feet per second, or thereabouts, the resistance increases very nearly with the square of the velocity, yet from that point it increases in a much quicker ratio; so that to a ball moving at the rate of 1700 feet per second, it is three times as great as we should obtain from our first hypothesis. The resistance to an iron ball of twelve pounds weight, moving at the rate of twenty-five feet per second, is equivalent to a pressure of half an ounce avoirdupois; if we increase twenty-five feet per second to 1700 feet per second, or multiply the first sixty-eight times, the square of which is 68×68 or 4624, we might, from the first part of this article, expect a resistance of 4624 half ounces, or 144½ pounds; instead of which, it is found to be 433½ pounds; about three times the preceding, as we said. At a velocity of 1600 feet per second, the resistance was found to be more than twice that given by the theory. Without entering further into details, for which the reader may consult the article GUNNERY, to which they particularly apply—and also without considering the effect which the different forms of bodies have upon the RESISTANCE, (to which refer)—we give some of the conclusions to which Dr. Hutton was led by a long and careful repetition of the experiments of Mr. Robins, his celebrated predecessor in the same track. For the method of conducting these experiments, see WHIRLING MACHINE, BALLISTIC PENDULUM.



1. The resistance is nearly in the same proportion as the surface exposed, but a little greater than this proportion on the larger surface. That is, if we take two bodies of the same figure and material, (two iron spheres for example,) the surface of the second being twice that of the first, the resistance to the larger sphere is a little more than twice that of the smaller, the velocities being the same in both.

2. The round ends and sharp ends of solids suffer less resistance than the flat ends of the same. Thus, the sharp end or vertex of a cone is less resisted than the flat end or base.

3. Two solids, having the parts presented to, or which push the air, the same, are not equally resisted unless the hinder parts are also the same.

Though we have hitherto considered the resistance offered to a body moving against still air, and the pressure which is necessary to maintain it at a given velocity, yet the problem is exactly the same, if we suppose the body to remain still, and the air, or as we now call it, the wind, to move against it with the same velocity. Suppose the body to move 100 feet in a second, and that the spectator is carried along without his knowledge at the same rate. He will, therefore, always be in the same place with respect to the body, and will at the same time imagine that the air or wind is coming towards him at the rate of 100 feet per second. The force which, when he imagined the body moving, he called the pressure necessary to maintain its velocity, he will now say is the pressure necessary to steady it against the wind.

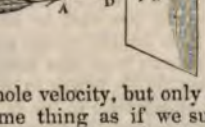
If we suppose both the wind and the body in motion, the resistance is variously modified, according to the direction of the motions of the two. If the wind and the body move in the same direction, with the same velocity, there is no resistance, for no air is displaced by the body. If the wind move 50 feet per second, and the body 100 feet, the pressure on the body is the same as if it were at rest, with a *contrary* wind of 50 feet per second blowing on it. If the wind and the body move in contrary directions, with velocities of 100 feet, the resistance is that of a wind of 200 feet per second; and so on. If the spectator move with the body unknowingly, the magnitude and direction which he will assign to the wind is that which will produce such a pressure on the body *at rest*, as it really sustains when in motion. [See APPARENT MOTION.]

The following well-known table, first given by Mr. Smeaton in the *Philosophical Transactions* for 1759, and confirmed by the experiments of Dr. Hutton, shows, in pounds avoirdupois, the pressure which different winds will exert upon a square foot of surface exposed directly against them. The first column is a rough representation of the second.

Velocity of Wind.		Force on one square foot in pounds avoirdupois.	Character of the Wind.
Miles per Hour.	Feet per second.		
1	1·47	·005	Hardly perceptible.
2	2·93	·020	Just perceptible.
3	4·40	·044	
4	5·87	·079	Gentle, pleasant wind.
5	7.33	·123	
10	14·67	·492	Pleasant, brisk gale.
15	22·00	1·107	
20	29·34	1·968	Very brisk.
25	36·67	3·075	
30	44·01	4·429	High winds.
35	51·34	6·027	
40	58·68	7·873	Very high.
45	66·01	9·963	
50	73·35	12·300	Storm or tempest.
60	88·02	17·715	Great storm.
80	117·36	31·490	Hurricane.
100	146·70	49·200	Destructive hurricane.

For the method of obtaining these results see ANEMOMETER.

Let us suppose the square foot of surface placed obliquely, so as to make an angle A B C, with the direction A B of the wind. Let D B represent the velocity of the wind per second. Then, if D E be drawn perpendicular to B C (see COMPOSITION OF VELOCITIES) the wind which strikes the plane at B does not strike it directly with its whole velocity, but only with the velocity D E; it being the same thing as if we supposed the wind to be carried direct against the plane with the velocity D E, and at the same time shifted on the surface from C towards B with the velocity E B. This last will only make different particles of air strike the point B, but not with different forces. This line D E is in



trigonometry proportional to the *sine* of the angle D B E. Again, if we draw E F perpendicular to D B, the whole of the velocity D E is not in the direction of the wind, A B, but only the part of it D F; the other component, F E, being employed in moving the plane in a direction perpendicular to that of the wind. This line, D F, which represents the *effective* velocity of the wind in the direction A B, is, as the square of the sine of the angle A C B. The line, D F, is a third proportional to D B and D E, so that if we suppose the wind to move at the rate of 100 feet in a second, and the plane to be so inclined that it strikes the plane directly with only eighty feet of velocity, we have, for the real effective velocity 100 : 80 :: 80 : 64; or we must consider this plane as resisting a wind of only 64 feet of velocity. This theory is liable to the objections of the former one, as it does not allow for any condensation, but supposes the particles to disappear after they have struck the plane. Nevertheless, it is found in practice to answer well enough when the plane is not very oblique to the wind. For the mathematician, we may state that the following empirical formula is found from Smeaton's experiments to be much nearer the truth, which, as he will see, is nearly equivalent to the square of the sine of the angle of inclination, when the latter is nearly a right angle. Let the angle of inclination of the surface be θ, and the velocity of the wind V, then the effective velocity is

$$V \sin \theta^{1\cdot842 \cos\theta} \text{ nearly.}$$

For further information, we should recommend the treatise on Pneumatics, written for the *Encyclopædia Metropolitana*, by Professor Barlow, in which the experiments referred to in this article will be found clearly detailed: and also to the articles RESISTANCE, WIND, ANEMOMETER, in Dr. Hutton's *Mathematical Dictionary*.

AEROLITES, called also METEORIC STONES, are bodies which have fallen on the earth from the atmosphere, and are named from ἀήρ (*aer*), atmosphere, and λίθος (*lithos*), a stone. We possess historical records from very remote antiquity, and numerous writers in all ages have mentioned instances, of the remarkable phenomenon of stony bodies having been seen to fall from the sky; yet, till within the last thirty years, all such accounts were treated as tales of the ignorant and superstitious. The history of aërolites affords a most useful lesson how cautious we ought to be not to reject too hastily the narratives either of early authors or of living witnesses, however extraordinary they may be, solely on the ground that they are inconsistent with our experience of the laws of nature. When the official notice from the local authorities, of the shower of stones at L'Aigle in Normandy, in 1803, was received at Paris, it afforded a subject of merriment to the wits of that day; and the newspapers expressed their compassion for the good people of L'Aigle, who were governed by a mayor so silly as to give credit to such nonsense as that stones had fallen from the clouds. The first man of science who directed attention to the subject of aërolites was Chladni, a German philosopher, who, in a tract published at Riga and Leipzig, in 1794, upon the mass of native iron found by Pallas in Siberia, maintained the credibility of the traditions of that and other stony bodies having fallen from the air. His sagacious inductions, although they failed at the time to make any great impression, prepared philosophers for a more willing reception of the evidence as to two instances of the same extraordinary event, which were shortly afterwards brought under their notice. In 1796, a stone was exhibited in London, weighing fifty-six pounds, which was said to have fallen in Yorkshire, in December of the preceding year; but, although the fact was attested by several credible witnesses, the possibility of such an occurrence was still doubted. It was remarked, however, by Sir Joseph Banks, that there was a great resemblance between the Yorkshire stone and one in his possession, sent to him from Italy, with an account of its having fallen from the clouds, along with many others of a similar nature, near Sienna, in July, 1794. In the year 1799, Sir Joseph Banks received a circumstantial account, accompanied by specimens, of a fall of stones from the atmosphere, which was said to have taken place near Benares, in the East Indies, in the preceding December; and as these specimens were also nearly identical with the Yorkshire stone, incredulity began to give way. It was not, however, until the appearance of the celebrated paper of Howard, in the *Philosophical Transactions* for 1802, giving an account of his analysis of the Benares stone, that men of science declared their belief in the phenomenon, supported, as the evidence then was, by the researches and opinion of so cautious and accurate an inquirer; and the fall of stones at L'Aigle, above alluded to, which took place in the following year, at the time the memoir of Howard was in the hands of the public, removed all doubt. The Institute of France deputed the celebrated Biot to examine, on the spot, the whole circumstances attending this remarkable event; and the result of his labours will be found in his report, in the seventh volume of the *Mémoires de l'Institut*. He satisfied himself of the authenticity of the facts which had been narrated; and the specimens he collected on the ground, being analysed by Vauquelin and Thenard, yielded the same result as the analysis of the Benares stone by Howard. Thus was the ingenious induction of Chladni, in 1794, confirmed beyond dispute; and Cuvier, in his Report, in 1809, of the Progress of Science during the preceding ten years, states 'that the phenomenon of stones fallen from the atmosphere, known both in antiquity and during the middle ages, had only been established as truths in physical science, during that period, by the conjectures of Chladni, the analyses of Howard, Vauquelin, and Laugier, and the researches of Biot.' Chladni was entitled to far more honourable mention than to have his sound inductions designated as conjectures. By this series of observation and experiment, not only was the truth of the recent occurrences established, but the instances recorded by the writers of past times, which had been rejected as the delusions of a credulous and ignorant age, received so high a degree of probability, as to entitle them to be classed among the authentic documents of past events in the physical history of the earth.

An account of the circumstances that attended the fall of stones at Benares and at L'Aigle will convey the best idea of the phenomenon, not only as it occurred in these two cases, but in most other instances of which a circumstantial description has been preserved. They are always accompanied by a meteor, which at night appears like a burning fiery ball, surrounded by a brilliant vapour, and with a tail like a comet; in the day, on account of the strong light of the sun, and the smoke and vapour evolved, the meteor looks more like a small cloud of different colours, and of a singular form, which, after a powerful explosion, seems to burst and scatter its contents.

At a short distance from Benares, on the 19th of December, 1798, about eight o'clock in the evening, in the form of a large ball of fire; it was accompanied by a loud noise, resembling that of thunder, which was immediately followed by the sound of the fall of heavy bodies. On examining the ground, it was observed to have been newly torn up in many places, and in these stones were found of a peculiar appearance, most of which had buried themselves to the depth of six inches. At the time the meteor appeared, the sky was perfectly serene, not the smallest vestige of a cloud had been seen since the 11th of the month, nor were any observed for many days after. It was seen in the western part of the hemisphere, and was only a short time visible. The light from it was so great, as to cast strong shadows from the bars of a window upon a dark carpet, and it appeared as luminous as the brightest moonlight. Many of the stones were collected, and some of them weighed two pounds each.

On the 26th of April, 1803, at one o'clock in the afternoon, the sky being clear, with the exception of a few light clouds, a ball of fire was observed in Normandy, in many places far distant from each other—namely, Caen, Falaise, Alençon, Verneuil, and Pont Audemer, which moved rapidly from south-east to north-west; and about the same time, in the district of L'Aigle, loud explosions were heard, which lasted from five to six minutes, resembling the sound of cannon and musketry, and were followed by a long-continued noise, like that of many drums. The meteor from which the noise proceeded appeared not so much like a ball of fire, but rather like a small rectangular cloud, which, during the phenomenon, seemed not to move; but the vapour of which it consisted, was sent out, after each explosion, in all directions. It seemed to be about half a league north-west from L'Aigle, and must have been at a very considerable elevation, at it appeared to the inhabitants of two villages more than a league distant from each other, to be immediately over their heads at the same instant. Throughout the whole district over which the cloud hung, there was heard a hissing noise, like that of a stone from a sling, and a vast number of stones fell to the ground. The space on which they fell formed an ellipse of two leagues and a half long by one broad, the larger diameter being from south-east to north-west, the direction in which the meteor moved: the largest stones were found at the south-east end of the ellipse, and the smallest at the opposite extremity. Above two thousand were collected, and they varied in weight from two drams to seventeen pounds and a half.

Aërolites, when taken up soon after their fall, are extremely hot. They are generally angular, of prismatic and pyramidal forms, the angles being rounded; their broken irregular surface is coated with a fused black crust, like varnish, seldom exceeding a quarter of a line in thickness. When broken, they differ a little in appearance; but they are, for the most part, composed of a collection of small spherical bodies, of a grey colour, imbedded in a gritty substance, and often interspersed with yellow spots. One of the most remarkable circumstances is the great similarity of composition of all the meteoric *stones*, on whatever part of the earth they have fallen. Iron is found in all, and in a considerable proportion, partly in a malleable state, partly in that of an oxide, and always in combination with a greater or less proportion of the rare metal called nickel: the earths silica and magnesia and sulphur constitute the other chief ingredients; but the earths alumina and lime, the metals manganese, chrome and cobalt, together with carbon, soda, and water, have also been found in minute and variable quantities, but not in the same specimens. The variations discovered by analysis are never, however, sufficient to destroy that affinity of external character by which they are instantly recognized. No new substance, nothing with which we were not already acquainted, has ever been discovered in their composition. But, although all the constituent elements are found in different mineral substances, no combination of them, similar to that in meteoric stones, has ever been met with, either among the stratified rocks of any period of formation, or among the unstratified rocks, or among the products of any volcano, extinct or in activity. Their specific gravity is about 3.50, but varies according to the proportion of iron which they contain. They are sometimes very friable, sometimes very hard; and some that are friable when they first fall, become hard afterwards. In size they vary from two drams weight to three hundred pounds. One of the stones which fell at L'Aigle yielded by the analysis of Thenard,—

Silica	46 per cent
Magnesia . . .	10
Iron	45
Nickel	2
Sulphur . . .	5

and Laugier afterwards discovered the presence of chrome in it. Frequently small detached portions of malleable iron are disseminated through the mass, and the black crust acts powerfully on the magnet.

The appearance of these bodies is not periodical, nor connected with any particular state of the atmosphere, nor of the weather; and they have fallen in all climates, on every part of the earth, at all seasons, in the night and in the day.

Chladni has compiled a very copious catalogue of all recorded instances, from the earliest times: of which twenty-seven are previous to the Christian era; thirty-five from the beginning of the first to the end of the fourteenth century; eighty-nine from the beginning of the fifteenth to the date of the fall at L'Aigle at the beginning of the present century; and it appears from Chladni's list, and Van Hoff's continuation, that during the last thirty years, since the attention of scientific men has been directed to the subject, above sixty different cases have been recorded. Numerous as these may appear, they can form but a small proportion of the whole amount, when we compare the small extent of surface occupied by those capable of keeping a record of such events, with the wide expanse of the ocean, the vast uninhabited deserts, mountains, and forests, and the countries possessed by savage nations. Many of those which occur in the night must also escape observation even in civilized countries.

Among the more remarkable instances to be met with in ancient authors, the following may be mentioned. Livy states that, in the reign of Tullus Hostilius (about 654 years B. C.), a shower of stones fell on the Alban Mount, not far distant from Rome. Plutarch, in the Life of Lysander, describes a stone that fell at Ægos Potami, in the Hellespont, near the modern Gallipoli, about 405 B. C., which is also mentioned by the elder Pliny (Book II.), who says that it was to be seen in his time, that is, five hundred years afterwards, and that it was as large as a waggon, of a burnt colour, and its fall was accompanied by a meteor. It is also recorded in the Parian Chronicle. The mother of the gods was worshipped at Pessinus, in Galatia, under the form of a stone, which was said to have fallen from heaven; and that stone, in consequence of a treaty with Attalus, king of Pergamus, was solemnly brought to Rome by Publius Scipio Nasica, about 204 years B. C., and placed in the Temple of Cybele. The sun was worshipped at Emesa, in Syria, under the form of a large, conical, *black* stone, which, as the people about the temple reported, fell upon the earth. It was afterwards brought with great pomp to Rome by Elagabalus, who had been high-priest of the temple; and the description of it, given by Herodian, (Book V.) accords with the appearance of a meteoric stone.

One of the cases of more modern date, most circumstantially described, is that of the stone which fell at Ensisheim, in Alsace, in 1492. The Emperor Maximilian being there at the time, ordered an account of the event to be drawn up. It weighed 270 pounds; and was afterwards suspended by a chain in the church at Ensisheim for three centuries. During the French revolution, it was carried off to Colmar, and many pieces were broken from it. One of these is in the museum at the *Jardin des Plantes*, near Paris; it is identical in composition with other meteoric stones, and contains native or malleable iron. What remained of the precious relic has since been restored to the good people of Ensisheim, and it now stands near the great altar in their church.

Besides aërolites properly so called, masses of malleable iron, often of vast size, have been found in situations, which, together with their composition, leave no doubt as to their being of meteoric origin. An immense mass, seen by Pallas in Siberia, which forms the subject of Chladni's tract in 1794 above alluded to, was found quite insulated, at a great elevation on a mountain of slate near the river Jenesei, removed from everything that could excite suspicion of its being a production of art, and totally different from any ore of iron seen either before or since that time. The tradition was, that it had fallen from heaven, and, as such, was held in veneration by the Tartars; but it was removed in 1749 to the neighbouring town of Krasnojarsk by the inspector of the iron mines there. The mass, which weighed about 1400 lbs., was of an irregular form, not solid, but cellular like a sponge, the cells containing small granular bodies of a glassy nature, afterwards found to be the simple mineral olivine, so common in basalt. The iron was tough and malleable, and, according to the analysis of Howard, yielded 17 per cent. of nickel, but Klaproth and John found a much smaller proportion of nickel, and Laugier found by another analysis silica, magnesia, sulphur, and chrome. The disagreement of such skilful operators shows that the mass was not uniform in its composition. Another vast mass of meteoric iron was found in South America, in the jurisdiction of Santiago del Estero, about 500 miles north-west from Buenos Ayres, and is described in a memoir in the Spanish language, printed in the Philosophical Transactions for 1788, by Don Rubin de Celis, who was sent by the governor of the province to examine it. It lay in a vast plain of above a hundred leagues in extent, half sunk in the ground, and the size was such as, estimating it by the specific gravity of iron, would give a weight of more than thirteen tons. According to the analysis of Proust and of Howard, it contains 90 per cent. of iron, and 10 of nickel. Specimens of this mass, which were sent to the Royal Society by Don Rubin de Celis, are in the collection of the British Museum. A mass of meteoric iron at the Cape of Good Hope, mentioned by Barrow in his Travels in Africa, as an artificial production, is described by Van Marum in the Haarlem Transactions, a large portion of it having been sent to the public museum there by the governor of the colony. The mass, when found, was equal to about 177 lbs., but much had been carried away. The specific gravity is 7.604. Tennant found it to contain 1.10 per cent. of nickel, and a trace of carbon, and Stromeyer detected cobalt in it, which last metal has also been found by Dr. Turner in some meteoric iron from Buenos Ayres. Another mass was found in Brazil, about fifty leagues from Bahia, the weight of which was estimated at 14,000 lbs.; a fragment of this, analysed by Dr. Wollaston, yielded 4 per cent. of nickel. Many other instances of similar masses of iron might be mentioned, which are evidently of meteoric origin; but the only instance on record of iron having been actually seen to fall from the atmosphere, is that which took place at Agram, in Croatia, in 1751. On the 26th of May, about six o'clock in the evening, the sky being quite clear, there was seen a ball of fire, which shot along with a hollow noise from W. to E., and after a loud explosion, accompanied by a great smoke, two masses of iron fell from it, in the form of chains welded together.

Aërolites and meteoric iron are not the only products of meteors which have fallen upon the earth after explosion. Numerous instances are mentioned of black and red dust, which has covered great tracts of land; and it is remarkable that such dust has generally been found to contain small hard angular grains resembling augite. There have also been cases of the fall of a soft gelatinous matter of a red colour like coagulated blood, which have given rise to the stories of the sky having rained blood. Such appearances have not unfrequently accompanied the fall of stones. On the 15th November, 1755, rain of a red colour fell around Ulm and the Lake of Constance, and on the same day in Russia and Sweden. The red water was of an acid taste, probably from the presence of sulphuric acid; and the precipitate, which was flaky like snow, when dried, was attracted by the magnet. In the night of the 5th March, 1803, a red dust, in some places accompanied by rain, fell in different parts of Italy. In Apulia, there was first a very high wind with much noise, and then a reddish black cloud appeared coming from the S.E., from which there fell a yellowish-red rain, and afterwards a quantity of red dust. It continued the whole of the following day and part of the succeeding; the dust was examined, and was not found to be volcanic. Fabroni, in the Annales de Chimie, tom. lxxxiii, says, that near Arezzo, in March, 1813, the ground being then covered with snow, there was a shower of fresh snow of a red colour, which continued for many hours, accompanied the whole time with a sound like that of the violent dashing of waves at a distance; the greatest fall was accompanied with two or three explosions like thunder. The red snow being melted, a precipitate was obtained of a nankeen colour, which yielded silica, lime, alumina, iron, and manganese.

The origin of this remarkable class of natural phenomena is involved in great obscurity, and many different theories have been proposed to account for them. By some they have been supposed to be bodies ejected from distant volcanos belonging to our earth,—a conjecture which is refuted by every circumstance connected with them. No substance in the least resembling aërolites has ever been found in or near any volcano; they fall from a height to which no volcano can be supposed to have projected them, far less to have given them the horizontal direction in which meteors invariably move for a considerable part of their course. Another hypothesis is, that meteoric bodies are formed in the atmosphere, which is equally untenable; for, in the first place, there is no ground for supposing, from any discoveries yet made in chemistry, that the elements of which they are composed exist in the atmosphere; and even if they did, the enormity of the volume of the atmosphere, attenuated as it is at the great height from which the meteors fall, which would be required to produce a solid mass of iron of thirteen tons weight, places the conjecture beyond all credibility. But even granting so extravagant a proposition, and supposing the mass to be formed, what force could exist in the atmosphere to project it with the velocity with which meteors move, which has been calculated to be often greater than that of the earth in its orbit? A third hypothesis is, that they are bodies thrown out by the volcanos which are known to exist in the moon, with such force as to bring them within the sphere of the earth's attraction. This hypothesis was so far entertained by Laplace, that he calculated the degree of lunar volcanic force that would be necessary for this purpose. He calculated that a body projected from the moon with a velocity of 7771 feet in the first second would reach our earth in about two days and a-half; but Olbers and other astronomers are of opinion that the velocity of the meteors, which has been estimated in some cases to be at first equal to some miles in a second, is too great to admit of the possibility of their having come from the moon. The theory which is most consistent with all known facts and laws of nature is that proposed by Chladni, viz., that the meteors are bodies moving in space, either accumulations of matter as originally created, or fragments separated from a larger mass of a similar nature. This opinion has also been advanced by Sir Humphrey Davy, at the conclusion of one of his papers in the Philosophical Transactions for 1817, giving an account of his researches on flame. 'The luminous appearances of shooting stars and meteors cannot,' he says, 'be owing to any inflammation of elastic fluids, but must depend upon the ignition of solid bodies. Dr. Halley calculated the height of a meteor at ninety miles, and the great American meteor which threw down showers of stones was estimated at seventeen miles high. The velocity of motion of these bodies must, in all cases, be immensely great, and the heat produced by the compression of the most rarefied air from the velocity of motion must be probably sufficient to ignite the mass; and all the phenomena may be explained, if *falling stars* be supposed to be small solid bodies moving round the earth in very excentric orbits, which become ignited only when they pass with immense velocity through the upper region of the atmosphere, and if the *meteoric bodies* which throw down stones with explosions be supposed to be similar bodies which contain either combustible or elastic matter.'

Those who wish to investigate this curious subject will find it most ably and copiously treated in Chladni's work, '*Ueber Feuer-Meteore, und über die mit denselben herabgefallenen Massen*,' Vienna, 1819. He continued his researches to the time of his death, and published them in *Gilbert's Annalen der Physik*, since which time the subject has been taken up by his friend Von Hoff, in Poggendorf's continuation of Gilbert. The '*Lithologie Atmosphêrique*' of Izarn may also be consulted; and there is a good compilation by Bigot de Morogues, entitled '*Mèmoire historique et physique sur les Chûtes des Pierres*,' Orleans, 1812.

AËRONAUTICS. From two Greek words, signifying *sailing in air*. [See BALLOON.]

AËROSTATICS, AËROSTATION, derived from two Greek words signifying, *standing in air*, is the science which teaches the equilibrium of bodies supported in air, gas, or vapour. For every essential point not explained in HYDROSTATICS, refer to BAROMETER, and BALLOON.

Æ'SCHINES, commonly called the *Orator*, to distinguish him from another of the same name, was born at Athens B.C. 393. At this period of Athenian history, orator and statesman may be considered as almost synonymous terms, for, without some superiority in the art of speaking, it was impossible to attain any great eminence in political life. In all communities of a democratic character, the power of public speaking, which too often includes the power of deceiving large numbers, has been to the adventurer one of the surest passports to political eminence, and to a people one of the causes of national misfortune. sophistry and words have often had the victory over honesty and wisdom. These remarks are suggested by reflecting on the history of Æschines and his rival Demosthenes, both of whom elevated themselves by their oratorical talents to the most prominent stations in the Athenian democracy; and though they have, by mutual recrimination, cast grievous imputations on the character of each other neither of them has been so fortunate as to free himself from the well-grounded suspicion of political, if not private, dishonesty.

The name of Æschines' father was Atrometus. According to the account of his enemies, he had been a slave, and had obtained his freedom, but his son asserts that he was a true-born Athenian. However this may be, he was poor enough to be a schoolmaster, with which Demosthenes upbraids his rival as if it were a low and sordid profession. 'While a boy,' says Demosthenes, 'thou wast brought up in great poverty, attending thy father in the school, making ink, cleaning the benches, and sweeping the school,—occupations such as befit a slave, and not a free-born youth.' The imputations which this great proficient in the art of abuse cast on the mother of Æschines were of a still less equivocal character. Æschines, when he was a little older, if we trust the testimony of Demosthenes, became a kind of clerk to some of the inferior magistrates, an occupation perhaps not unlike that of a clerk to a country justice. His next step was somewhat bolder: having a good voice and a fine person, he tried his fortune on the stage, though his success was probably not great. Whether he stepped from the stage direct into the more busy theatre of public life, we do not know; but he did finally come forward, though not at an early age, as a public man. Æschines had two brothers, one of whom, Philochares, like himself, had been a clerk or secretary; the other, Aphobetus, is said by Demosthenes to have got his living by painting alabaster vases or vessels; but Æschines denies this too. Demosthenes asserts that Æschines and Philochares served also as *public* clerks for two years. By having discharged his functions as a clerk, and having been in the service of the orators Aristophon and Eubulus in some similar capacity, he had acquired some knowledge of the laws of his country. In short, he was a bold adventurer, gifted with many of those qualities that are calculated to ensure success in the dubious game of political warfare.

Only three orations of Æschines are extant, all of which relate to important events in his public life. He was accused by Demosthenes, one of his fellow ambassadors, of malversation and corruption in his second embassy to King Philip, the object of which was to obtain Philip's ratification of the treaty of peace, and to this attack he replied in his oration entitled 'On Malversation in his Embassy.' Timarchus, a friend of Demosthenes, had joined in the attack on Æschines; but the orator speedily rid himself of this adversary by prosecuting him for a disreputable course of life. Æschines gained his cause, and Timarchus, according to some accounts, concluded the affair by hanging himself. The oration on this subject is called 'Against Timarchus.' The delay caused by the prosecution of Timarchus deferred the prosecution of Æschines till about three years after his return from the second embassy, which was no doubt favourable to the accused, as it tended to destroy the popular feeling against Æschines, who finally escaped from a verdict against him. The third oration is entitled 'Against Ctesiphon,' but is, in fact, an attack on Demosthenes, who replied in his famous oration called 'The Crown.' The pretext on which Æschines attacked Ctesiphon was this:—For some public services which Demosthenes had rendered to the state, it was proposed by Ctesiphon that he should receive a golden crown, but this proposition was considered by Æschines to contain clauses contrary to existing laws. He also denied the claim of Demosthenes on the ground of public services. As early as B.C. 338, Æschines had declared his intention to prosecute Ctesiphon, but the cause was not tried till B.C. 330, after the death of Philip, while Alexander was in the midst of his Asiatic conquests. Æschines lost his cause, and not having obtained one-fifth part of the votes of the jury, he was compelled to leave Athens, being unable to pay the penalty in that case required by the law. He retreated to the island of Rhodes, where, it is said, he resumed the profession of his earlier days, by opening classes for instruction in elocution, and became the founder of a school of eloquence. He is said to have died at Samos, B.C. 317.—[See DEMOSTHENES.]

To convey by description any exact idea of the style of this or any other great orator, we feel to be almost impossible; and, instead of a number of general remarks, which might only mislead, we must refer our English readers to the translations of Æschines, inadequate as they are, and as all translation must be, to reflect a faithful image of a language no longer spoken in its purity, and of a train of events belonging to a different system of social life. The Greek and Roman critics considered the Rhodian school of eloquence, of which Æschines was the reputed founder, to be characterized by a happy mean between the florid Asiatic and the dry and more sententious Athenian style. To us, of the present day, the style of Æschines appears distinguished by great perspicuity and correctness of language. His narrative and descriptive powers deserve high praise, nor are we disposed to undervalue his powers of abuse, though in this he falls far below his great rival. We have the strongest testimony to his *personal* qualifications as an orator, in the reluctant, but unambiguous manner in which Demosthenes acknowledges his own inferiority.

There are numerous editions of Æschines: the latest and best, as far as the mere text is concerned, is included in Bekker's edition of the *Attic Orators*, Oxford, 1822. One of the best editions of Æschines alone is by J. H. Bremius, 1824, 2 vols. 8vo. The Abbé Auger translated the orations and letters of Æschines into French, and inserted them in the second volume of his *Demosthenes*. The oration of Æschines against Ctesiphon, with the reply of Demosthenes, was translated into Latin by Cicero, and into German by Fr. Raumer, 1811.

There are twelve letters extant attributed to Æschines, the genuineness of which, we fear, would not stand the test of a thorough examination. It was usual, in the later ages of Greek literature, for rhetoric masters to employ themselves on fictions of this kind. [For a specimen of the style of Æschines, see the *Penny Magazine*, No. 63, p. 117].

Æ'SCHINES the *Philosopher* was one of the scholars of Socrates, and, as the story goes, the son of a sausage-maker. Three dialogues, still extant, that have usually gone under his name, after passing through the furnace of modern criticism, have been declared not to be written by him. The language of these dialogues proves them, however, to belong to an age when Greek was still written with great purity.

Æ'SCHYLUS, the son of Euphorion, and a native of Eleusis in Attica, was born about B.C. 525, and died in Sicily probably about B.C. 456. As the great father of the Athenian drama, Æschylus occupies one of the most prominent places in the history of the literature of his country. Like most of the great writers of antiquity, however, the particulars of his life that have come down to us are few and unimportant, with the exception that the warrior-poet fought bravely in the great struggles against the power of Persia, in the battles of Marathon and Salamis. In the later years of his life he visited the court of Hiero, king of Syracuse in Sicily, who, being a patron of poets and learned men, had collected around him the most illustrious writers of that day, such as Pindar and Simonides. An odd story is told of the cause of the poet's death: an eagle that was carrying off a tortoise let it fall on the great dramatist's head, mistaking the bald pate, as the story rather humourously concludes, for a stone.

Seven tragedies of Æschylus, out of a very large number that he wrote, still remain, entitled, respectively, *The Prometheus Bound; The Seven against Thebes; The Persians; The Female Suppliants; The Agamemnon; Choëphori* (libation-bearers); and *Eumenides*, or *Furies*. The three last form a continuous drama or *action*, which contains (1) the return of Agamemnon from Troy, and his murder by his wife Clytemnestra; (2) the revenge of Orestes, the son of Agamemnon, who kills his mother and the adulterer Ægisthus; and (3) the persecution of Orestes by the Furies, and his release therefrom by the sentence of the high court of Areopagus at Athens, and the casting vote of Minerva. It was usual with the candidates for the dramatic prize at Athens to write three tragedies on some connected subject, to which they added a fourth, called a satyric drama, on some subject treated in a tragi-comic style. The *Prometheus Bound* of Æschylus belongs to a set of this description, for we know that there was a play entitled *Prometheus the Fire-stealer*, and a third named *Prometheus Loosed*.

The Greek drama, in its origin, consisted simply of a chorus or company, who celebrated the festivals of some deity or hero by appropriate songs and dances. The introduction of a personage to tell some story or history was an innovation, and the connecting this narrator more closely with the chorus was a still further step towards the *drama*, a Greek word which signifies *an action*, or, in its more technical sense, *the representation of a series of events ending in some striking catastrophe*. But Æschylus carried improvement still further, by introducing a second speaker, and thus making the *dialogue*, as it really is, the *essential* part of tragedy. To the chorus, however, Æschylus still allowed a great degree of importance, as we may see from his extant plays, in which the choral songs occupy a large part. He added also to stage effect by improving the dress of the actors, and giving them masks: in this latter respect our notion of good acting, which requires the expression of the countenance to be seen, is at variance with the usage of the Athenian stage. Our practice of painting faces comes nearer to that for which the invention of Æschylus was a substitute; for we are told that Thespis, his predecessor, went about the country in a waggon, and daubed the faces of his company with lees of wine.

It is difficult to convey an exact idea of the character of Æschylus as a dramatist, to those who have not read the original. The plot or plan of his plays is exceedingly simple; the personages are few in number, and the events follow one another without any complexity or occasioning any great surprise. His language is always forcible, and the dialogue clear where the Greek text has escaped damage; but unfortunately, in the frequent copyings to which the works of ancient writers have been subjected, they have often suffered serious injury, and few have sustained more corruption than the plays of Æschylus. In consequence of this, the choral parts are often exceedingly obscure, and this obscurity is increased by the wild, unrestrained, and gigantic conceptions of the poet, which seem as if they often strove with the imperfections of language, and endeavoured to find utterance by a superfluity of expression, a heaping together of strong epithets, and the use of long compound words. In spite of these defects, which often make the poetry of Æschylus border on bombast, and afforded a fair subject of ridicule to Aristophanes in his play called the *Frogs*, we may often admire in this noble writer a real sublimity of conception, a boldness of imagination, and a power to paint what is grand and terrific in language, that for force, simplicity, and truth, we can venture to say, has never been surpassed. The reader may see a specimen from the play of *Prometheus* in the *Penny Magazine*, No. 49, p. 2, and another from the *Persians*, in No. 51, p. 18.

The play of the *Persians* derives a peculiar interest from being the only extant Greek tragedy which treats of a subject contemporaneous with the age of the writer. It was written or acted probably about eight years after the battle of Salamis, and may be considered as the most durable monument, created by Grecian genius, to commemorate the defeat of the Asiatic invader. The poet writes as he fought, with a noble spirit of patriotism, such as animates every brave man's bosom when he sees an invader dare to tread on the hearth of his beloved home. Æschylus is one of those brilliant examples from antiquity, in modern times but rarely seen, of a man whose greatness in *action* was accompanied by an equal greatness of *intellectual* powers.

There are numerous editions of the works of Æschylus. The first was printed at Venice in 1518, 8vo., in the press of Aldus, after his death; but the *Agamemnon* and *Choëphori* are both incomplete in this edition, and what there is of the *Agamemnon* is oddly enough tagged to the *Choëphori*, which has lost its beginning; consequently this edition contains only *six* plays. Perhaps the best edition of the text of Æschylus is by Wellauer, 2 vols. 8vo. 1823. There is an English poetical version of Æschylus by John Potter, and also several poetical versions of the *Agamemnon*. The Germans have several poetical translations of Æschylus; the latest is by Voss, 1826. William Humboldt's translation of the *Agamemnon* (1816) is highly spoken of.

ÆSCULA'PIUS, or more properly, according to the Greek form of his name, ASCLE'PIUS, was the god of medicine in ancient mythology. Agreeably to the intricacy and confusion which prevails on that subject, several Æsculapii are said to have existed; and it would not be easy to determine whether tradition really pointed to so many distinct persons, or had merely handed down different versions of the parentage of the same man. Cicero mentions three: the first, son of Apollo, invented the probe, and the art of bandaging wounds; the second, son of Mercury, was struck dead by lightning; the third was of mortal parentage, son of Arsippus and Arsinoe, and first practised purging and tooth-drawing. The Egyptians also had their Æsculapius (as the Greeks call him), the son of Hermes. Of these the son of Apollo was by far the most celebrated. It is he who was worshipped in splendid temples at Epidaurus, Cos, &c.; and it is to him that the tales current among the poets and mythologists refer. Of the most important of these we proceed to give a brief sketch.

Asclepius was the son of Apollo by Coronis, daughter of Phlegyas. His mother, having succeeded in concealing her pregnancy, exposed the child upon Mount Myrtium, afterwards called Titthium, in Argolis, near Epidaurus. A shepherd, missing his dog and one of his goats, sought the wanderers throughout the country; and at last found them, the dog keeping watch over a child enveloped in flames, which the goat was suckling. The herdsman, 'thinking that it was something divine,' and being frightened, went away; but he spread the marvel abroad, and it was soon noised over all the globe, that Asclepius could heal every disease, and, besides, bring the dead to life.

Another version of the story says, that Apollo, in a fit of jealousy, having caused the mother's death, the unborn child was snatched by Mercury (or, according to Pindar, by Apollo himself) from her funeral pile. This circumstance may be connected with the other story, which assigns the parentage of Æsculapius to Mercury.

According to Pindar, Apollo sent the child to be educated by the Centaur Chiron, who instructed him in medicine, as at an after-period he did Achilles. Having reached manhood, he went with Castor and Pollux on the Argonautic expedition. Returning to Greece he practised with eminent success, not merely curing all diseases, but recalling the dead to life. Among others, he did this service to Hippolytus, son of Theseus. The gods regarded this as an invasion of their privileges, and at last Zeus (or Jupiter) struck the bold practitioner dead with lightning, in consequence of a complaint lodged by Pluto, that the infernal regions were entirely depopulated by these new proceedings. Apollo revenged the death of his son by killing all the Cyclopes who forged thunderbolts for Zeus. Finally Asclepius was raised to heaven, and made a constellation, under the name of Ophiuchus, the serpent-holder; though some say that Ophiuchus is Hercules.

In the later ages of paganism, when scepticism was very prevalent, and it was the fashion to see allegory in every mythological story, the whole was thus explained: Æsculapius signified the air, the medium of health and life. The sun was his father, because the sun, shaping his course agreeably to the changes of the seasons, produces a healthy state of the atmosphere. The same spirit is visible in the names given to his daughters, which all but one bear reference to the father's art: Hygieia, health; Panakeia, universal remedy; Iaso, healing; Aigle, splendour.

In Greece, the original seat of Asclepius's worship was in the neighbourhood of his birth-place, at Epidaurus; where a splendid temple was erected to his honour, adorned with a *chryselephantine* (gold and ivory) statue, half the size of the statue of Olympian Jupiter at Athens. He was represented sitting; one hand holding a staff, the other resting on a serpent's head; a dog couched at his feet. In coins and other ancient remains, he is commonly seen with a long beard, holding a staff with a serpent twined about it. Often he is accompanied by a cock; sometimes by an owl. The cock was commonly sacrificed to him, as is familiarly known from the last words of Socrates, as reported by Plato, 'Criton, we owe a cock to Asclepius.' These animals seem meant to typify the qualities which a physician should possess; the owl being emblematic of wisdom, the cock of vigilance, the serpent of sagacity, and, besides, of long life. The latter was especially sacred to Asclepius. At Epidaurus there was a peculiar breed of yellowish-brown snakes, of large size, harmless, and easily tamed, which frequented the temple, and in the form of which the god was supposed to manifest himself. In this shape he was conveyed to Sicyon, and at a later period, B.C. about 400, to Rome, when that city, being afflicted by pestilence, sent an embassy, at the command of an oracle, to fetch Asclepius to their help, with due respect. On the ambassadors being introduced into the temple, a serpent came from under the statue, and glided through the city, and on board their ship. This, of course, was the god, who, in this bodily shape, signified his willingness to accompany them. Arriving in the Tiber, he swam ashore to the island upon which his temple afterwards was built. A few inscriptions have been found in this island relating cures, and the means employed. The means are of such a nature that the cures must have been impostures, or have been wrought by the force of imagination: most likely the former. It was customary to place similar inscriptions in all temples of Asclepius. At Epidaurus, there were stones in the sacred precinct, erected in commemoration of cures performed by the god, recording, in the Doric dialect, the names and diseases of the patients, and detailing the method of cures employed. Six of these remained when Pausanias visited the place; and, besides, an ancient pillar, commemorating the gift of twenty horses by Hippolytus, in gratitude for his restoration to life. Similar testimonials of superstition may still be seen even in our own country. At least such did exist, a few years ago, at the well of Holywell, in Flintshire.

Of the extent of Asclepius's knowledge, and of his method of practice, or rather of that which prevailed in the early ages before the Trojan war, we know little. His sons, Machaon and Podalirius, who fought before Troy, and are often mentioned in Homer, seem only to have meddled with external injuries. Pindar, in a passage of rather doubtful meaning, seems to confine the father's skill within the same limits, when he speaks of him as healing those afflicted with self-produced ulcers, wounds from brass or stone, or injuries from summer heat, or cold. His remedies, on the same authority, were incantations, soothing drinks, external applications, and the knife. There is a remarkable passage in which Plato (Rep. iii. § 14), inveighing against the effeminacy of his own times, contrasts the attention of physicians to diet, exercise, &c., with the negligence of the sons of Asclepius in these respects; quoting a passage from Homer, in which Machaon, returning from battle severely wounded, partakes immediately of a mess of meal and cheese, mixed up in strong Pramnian wine (Il. Λ. 639.) He continues, that it is not to be supposed Asclepius failed through ignorance to teach his sons *gymnastic medicine*, by which he means diet, exercise, and every sort of care by which a weak constitution can be strengthened; but rather that the god meant medicine to profit those only who had some accidental ailment, but sound constitutions. This was the reason that Machaon and Podalirius paid no attention to their patients, except to dress their wounds; if the men were sound, wine and cheese would not hurt them; if not, let them die, and make room for better men. The argument is well suited to the general tenor of Plato's book: a simpler inference is, that Asclepius did not give precepts relative to diet, and the treatment of internal diseases, because he knew nothing about the matter. The passage is, at least, good evidence as to what the Asclepian practice was supposed to be in Plato's age. Gymnastic medicine was introduced by Herodicus, B.C. about 440.

For some centuries after the Trojan war, medical science, if it deserves that name, seems to have been confined to the temples of Asclepius, in which his descendants, the Asclepiadæ, who formed the priesthood, were alone allowed to practise: until, in later times, pupils were admitted into the brotherhood, having been solemnly initiated, and sworn to conform to its rules. Probably they made a large profit of the credulity of their patients. Their presumed impostures have been roughly handled by the Athenian comic poet Aristophanes in his play of the Plutus. The most celebrated temples, besides that at Epidaurus, were those of Rhodes, Cnidos, and Cos, where Hippocrates, a native of the island, is said to have profited by the records preserved in the temple. Croton and Cyrene also possessed schools of medicine. The practice seems to have been intended chiefly to work on the imagination. The god often gave his own prescriptions in dreams and visions, and the patients were to be prepared by religious rites for this divine intercourse. Bathing, abstinence, and tranquillity, assisted by a confident hope of benefit, may often have produced very beneficial effects; and, in a long course of experience, it is more than probable that some valuable knowledge of symptoms and remedies must have been collected. Of the progress which the Asclepiadæ appear to have made, we shall speak more fully under the article Hippocrates.

ÆʹSCULUS, or the HORSE-CHESTNUT, is a genus of plants belonging to the natural order Hippocastaneæ. It consists of trees found in the temperate parts of America and Asia, remarkable for the beauty of their flowers and leaves, and for their forming in some sort a type of tropical vegetation in northern latitudes. It must not be confounded with the Æsculus of the Romans, which was a kind of oak. See QUERCUS. The best known species is the *common horse-chestnut*, Æsculus Hippocastanum, a very handsome timber tree, formerly much used for avenues, and still extensively planted wherever round masses of wood, or gay flowering trees, are required. Its bark and its nuts are also among the more useful products that the hardy trees of this climate afford. It is very singular that the native country of this species should be unknown. One writer says it inhabits the northern parts of Asia; another, that it is found in the cold provinces of India; and a third assigns it to the mountain chains of Asia Minor; while all the positive information that books really afford is, that it was brought to Vienna from Constantinople in the beginning of the sixteenth century, and was thence dispersed through all Europe. No trace of it has been met with by the botanists who have explored Nepal and the Himalaya mountains; so that India may be considered as certainly not producing it, although plants resembling the horse-chestnut (see PAVIA) have been detected by Dr. Wallich, Mr. Royle, and others, among the noble vegetation of that Indo-Siberian region. It is more likely that some of the almost unknown provinces, lying between Casbin in Persia and Balk, will prove to be the native country of the species in question. The popular name of *horse*-chestnut has arisen from the custom among the Turks of grinding the nuts and mixing them with the provender given to horses that are broken-winded. Starch is also yielded in very considerable quantity by the nuts; but they are not used in the preparation of the starch of commerce. They contain, moreover, so large a quantity of potash as to be a useful substitute for soap; on the latter account, they were formerly employed extensively in the process of bleaching yarn, but are now seldom used. The powder of the dried nut excites sneezing; the bark, which contains a great deal of tannin, is not a bad substitute for Peruvian bark in fevers; and, finally, the starch of the nuts, deprived of its bitterness by maceration in weak ley, has been recommended as excellent nutritious food for horses, goats, oxen, and sheep. The general characters of the horse-chestnut are too well known to require description. As a forest tree, it is well adapted to light lands, upon which it will thrive, although they may be very sterile; in tenacious clay, it is always stunted and unhealthy, as in the Regent's Park; in rich alluvial soil, it acquires its greatest beauty. The timber is soft and spongy, and therefore of little value. There are no very old specimens in this country, the species having been introduced, as it is said, only in 1683; one of the most ancient is now growing opposite the Roebuck Inn, in the village of Lewisham, in Kent, of which the following is a view.

[Æsculus, or the Horse-Chestnut.]

Two varieties of the horse-chestnut are cultivated by gardeners; namely, the gold-striped and the silver-striped, but they are mere curiosities.

A second species, the *Æsculus Ohiotensis*, is found wild in North America, on the banks of the Ohio, between Pittsburgh and Marietta. In stature it varies from ten to thirty-five feet; and differs from the common kind in having larger and much more undulated leaves. In America, it flowers very early in the spring, producing large bunches of blossoms of a pure white. It has been cultivated for some years in this country, but has never flowered.

Besides these, a third species, *Æsculus carnea*—or, as it is sometimes called, *Æsculus rubicunda*, or *rosea*—is occasionally met with in gardens. Its origin is unknown; it differs from the common horse-chestnut in not attaining so large a size, and in having deep rose-coloured blossoms of striking beauty. For all purposes of ornament, this is much superior to the common kind.

Under the genus Æsculus it is customary to include the *buck's-eye chestnuts* of North America; but, as these species have a peculiar habit, and a fruit the surface of which is destitute of the spines with which the shell of the horse-chestnuts is armed, they are now distinguished by the generic name of PAVIA, which see.

The two first species of horse-chestnut are propagated by sowing their seeds either in the autumn at such a depth below the surface as to be secure from the attacks of mice, or else in the spring; but in the latter case they must be preserved during the winter in heaps of sand. The seeds should not be placed less than six inches apart in the beds, because the leaves are so large as to require more than usual space to expose themselves to light. The last species, and the varieties of the first, not yielding seeds, are multiplied by budding upon the common horse-chestnut.

ÆSOʹPUS, now commonly called ÆSOP, a Grecian author, who lived about the middle of the sixth century

B. C., contemporary with Solon and Pisistratus. He is usually acknowledged as the inventor of those short moral fictions to which we especially appropriate the name of fables. The popular stories of him are derived from a Life, written and prefixed to a collection of Fables, bearing the name of Æsop, by Maximus Planudes, a Constantinopolitan monk, about the middle of the fourteenth century. This contains a distorted view of the few incidents in his history which can be said to be known, mixed with a long series of dull buffoonery, and improbable or impossible adventures, and represents Æsop himself as a monster of personal deformity, apparently for the sake of contrasting his wit and acuteness with his bodily defects. This life is now given up, by general consent, as totally unworthy of credit; yet Æsop's ugliness is still commemorated in almost every account of him, although it depends for its acceptation solely, as we believe, on the justly-contemned authority of Planudes, and probably was devised to attract readers by a strong dose of the marvellous. There is no allusion to these personal peculiarities in any classical author, and strong negative reasons have been urged for believing that none such existed. See *Bentley's Dissertation upon Æsop*, subjoined to that upon Phalaris.

Rejecting these idle and vulgar fictions, if we seek for information in elder writers, there is little to be found relating to the personal history of Æsop. The place of his birth, like that of Homer, is matter of question; Samos, Sardis, Cotiæum in Phrygia, and Mesembria in Thrace, laying claim alike to that honour. The early part of his life was spent in slavery, and the names of three of his masters have been preserved: Dinarchus, an Athenian, in whose service he is said to have acquired a correct and pure knowledge of Greek; Xanthus, a Samian, who figures in Planudes as a philosopher, in order that the capacity of the slave may be set off by the incapacity of the master; and Iadmon, or Idmon, another Samian, by whom he was enfranchised. He acquired a high reputation in Greece for that species of composition which, after him, was called Æsopian, and, in consequence, was solicited by Crœsus to take up his abode at the Lydian court. Here he is said to have met Solon, and to have rebuked the sage for his uncourtly way of inculcating moral lessons.

He is said to have visited Athens during the usurpation of Pisistratus, and to have composed the fable of Jupiter and the Frogs for the instruction of the citizens (Phædrus, 1. 2). Being charged by Crœsus with an embassy to Delphi, in the course of which he was to distribute a sum of money to every Delphian, a quarrel arose between him and the citizens, in consequence of which he returned the money to his patron, alleging that those for whom it was meant were unworthy of it. The disappointed party, in return, got up a charge of sacrilege, upon which they put him to death. A pestilence which ensued was attributed to this crime, and in consequence they made proclamation at all the public assemblies of the Grecian nation, of their willingness to make compensation for Æsop's death, to any one who should appear to claim it. A grandson of his master Iadmon at length claimed and received it, no person more closely connected with the sufferer having appeared. This singular tale rests on the authority of Herodotus, and as it must have taken place, if not within his own knowledge, at least within the memory of many with whom he might have conversed, we cannot doubt the truth of the relation.

The time of Æsop's death is uncertain. Some place it as early as the 53d Olympiad, about 565 B.C. If, however, there be any truth in the scattered notices which we have combined, he was at Athens during the usurpation of Pisistratus, and met with his death in the service of Crœsus, and, therefore, before the capture of Sardis and fall of the Lydian kingdom. This, according to Newton's chronology, would fix his death in the 57th or 58th Olympiad, between the years 550 and 544 B.C. The Athenians erected a statue in his honour, from the hand of the celebrated sculptor Lysippus.

There is abundant proof that fables, passing under the name of Æsop, were current and popular in Athens during the most brilliant period of its literary history, and not much more than a century after the death of the supposed author. The 'drolleries of Æsop' (*Αἰσωπικὰ γελοῖα*) are mentioned by Aristophanes in terms which lead us to suppose that they were commonly repeated at convivial parties. Socrates, in prison, turned into verse 'those that he knew;' and Plato, who banishes the fictions of Homer from his ideal republic, speaks with high praise of the tendency of those of Æsop. Demetrius Phalereus made a collection of Æsopean fables, and we hear of two metrical versions of them, of still later date, one by an anonymous author, the other by Babrius. Phædrus published a collection of fables in Latin verse, in the time of Tiberius, the materials of which he professes to have taken from Æsop; and it is not improbable that the nearest approach to the substance of the original apologues may there be found. There is another collection, written in elegiac verse, in the fourth century, by Avienus.

There is no ground whatever for believing that the Greek prose fables, which pass under the name of Æsop, are really of his composition, at least that they came from his hands in their present state. Those which are substantially the same with the fables of Phædrus, the oldest to which we can assign a certain date, may be believed, for the reasons already assigned, to have originally emanated from the Grecian author. The total number of them is about 290 or 300, and they may be divided into two principal parcels: those published by Planudes, in number 144, which contain internal evidence that, as far as composition is concerned, they are of late date, and probably written by Planudes himself; and a second collection, of 136, first published in 1610 by Neveletus from manuscripts at Heidelberg. It is to be observed that not one of these MSS. contains the fables published by Planudes; and that the editor expresses his belief that they are the work of different hands. Some he attributes to the monks, because they contain allusions to the monastic life; which is, at least, sufficient evidence of their late date. This edition, which is a sort of *corpus fabularum*, contains 297 fables ascribed to Æsop, and 40 of the rhetorician Aphthonius, who lived in the third century; besides various metrical versions in Greek and Latin.

The eastern philosopher and fabulist Lokman is supposed by many to have been the same person as Æsop. The former, by the Mohammedan authorities, is made contemporary with David and Solomon; but his history is too uncertain for us to speculate upon it. It is, at least, certain that the same fables are to be found current under the names of each, and that the correspondence between their personal histories, as commonly told, is too close to be entirely accidental. [See BABRIUS, LOKMAN.]

ÆSTHE'TICS (*Æsthetik*) is the designation given by German writers to a branch of philosophical inquiry, the object of which is a philosophical theory of the beautiful, or, more definitely expressed, a philosophy of poetry and the fine arts, and which has by them been raised to the rank of a separate science. The word *Æsthetik* is derived from the Greek verb *αἰσϑάνομαι*, (I feel, or I am sensible,) and was first used as a scientific term by Alexander Baumgarten, a disciple of Christian Wolf, who in his *Æsthetica* (Frankfort, 1750-58, 2 vols. 8vo.) considered beauty as a given property of objects, of which we are *becoming sensible*. We perceive beauty, says Baumgarten, wherever we meet with perfection manifested in reality, and a thing is perfect if it is adequate to its notion: beauty, accordingly, is the perfectness of an object manifested in its appearance. The impulse to a deeper research into the essence of beauty was given by Winkelmann, who, without embodying his views in a regular system, developed them chiefly in reviewing and appreciating the remains of ancient sculpture. He adopted neither Baumgarten's 'adequateness of an object to its notion,' nor the sensual principle which had been proposed by Edmund Burke as the criterion of beauty; but considered the idea of beauty as dwelling in the divine mind, and as passing over from that source into individual objects. Kant denied the possibility of a strict science of beauty, inasmuch as beauty, according to him, is not a property of objects, but has its origin in the disposition of our mental faculties. We presuppose, says he, that some notion is contained in the apparent object, though we are unable abstractedly to express that notion; we assume that a tendency towards some purpose has presided over the formation of the manifold variety displayed before us, though we cannot precisely define that purpose,—and this supposition or assumption forms the basis of our perception of beauty. Schelling's view of beauty and art it is difficult to state concisely. His 'System of transcendental idealism' establishes the principle, that mind and nature, or conscious and unconscious existence, are primarily identical; that the laws discoverable in nature must accordingly be traceable to the laws of consciousness, whilst, *vice versâ*, the laws of consciousness must admit of being recognized as being likewise the laws of nature; in the divine mind both exist in absolute identity. The artist is to produce in his mind an intellectual intuition analogous to this identity, and the expression which he gives to the identity thus arrived at is the work of art. Beauty, according to Schelling, is that manifestation of the principle of art where the infinite appears contained in, or represented by the finite, or where, in the very object, the difference between the conscious and the unconscious (mind and nature) is annulled.

The above meagre definitions may serve in some measure to characterize the points from which some of the principal German philosophers have started in their respective systems of æsthetics. We think it not irrelevant to remind our readers that it is almost impossible to condense within a few words what it would require a dissertation fully to explain and to discuss; and also, that the opinions of any philosopher reported in a foreign language are always apt to appear to disadvantage, but more particularly so when the language in which they were originally expressed affords such wonderful facilities for the utterance of speculative thought as the German.

Most German writers, who have published systematic treatises on æsthetics, have, with greater or less independence, followed the principles laid down by Baumgarten, Kant, or Schelling. They commonly divide their systems into a general part, or a discussion of the essence of beauty and art, and a special one, or an inquiry into the peculiar character and predominant principles of the several branches of poetry on the one hand, and the fine arts (chiefly sculpture, architecture, painting, and music) on the other.

The following are some of the most popular German works on æsthetics. Krug's *Geschmackslehre oder Æsthetik*, in his *System der theoretischen Philosophie*, Königsberg, 1806-10. Ast's *System der Kunstlehre*, Leipzig, 1805; also, *Grundriss der Æsthetik*, Landshut, 1807, and *Grundlinien der Æsthetik*, Landshut, 1813, by the same author. Jean Paul's (F. Richter's) *Vorschule der Æsthetik*, 2d ed. Stuttgart, 1813. Bouterwek's *Æsthetik*, 2d ed. Leipzig, 1815. Solger's *Erwin: vier Gespräche über das Schöne und die Kunst*. Berlin, 1815, and his *Vorlesungen über Æsthetik, herausgegeben von K. W. L. Heyse*, Leipzig, 1829.

ÆSTUARY, a term sometimes used in geographical description, and generally in the sense of 'a wide opening at the mouth of a river, in which the tide rises and falls.' Thus, the outlet of the Mersey at Liverpool, that of the Humber at Hull, and the Solway frith, may be called æstuaries. The name has been derived from a Latin word *æstus*, which sometimes signifies 'a violent motion of the sea-water.'—[See BAY and GULF.]

ÆTHER, a Greek word now used to signify a highly volatile, penetrating, and combustible fluid, several kinds of which may be produced by the action of different acids upon spirit of wine or alcohol. That which was first prepared, and which is still most employed, is the sulphuric æther, procured by distilling a mixture of sulphuric acid and alcohol. This æther we shall first describe, as affording an example of the most perfect kind, for it consists, like the alcohol from which it is made, entirely of oxygen, hydrogen, and carbon, but in different proportions. It contains none of the acid used in its preparation, whereas some kinds of æther, presently to be noticed, owe their peculiar properties to an admixture of the acid employed in forming them.

Sulphuric æther may be obtained by the following process. pour a pint[*] of alcohol into a retort, add gradually to it a pound of sulphuric acid, occasionally shaking the mixture, and distil, with a fire rather quickly raised, into a cooled receiver, about ten ounces; add half a pint of alcohol to the residue in the retort, and distil about nine ounces, or continue the operation until the contents of the retort begin to froth, or the product becomes considerably sulphurous; mix the two products, and if the mixture consist of a light and a heavier fluid, pour off the former, which is a mixture of æther, alcohol, and water, and add potash to it as long as it can be dissolved. A dense liquor is formed by the solution of the potash in the alcohol and water, and upon this the æther floats, which is to be poured off into a retort, and about nine-tenths of it are to be distilled. This product is sulphuric æther, still containing, however, some alcohol; it possesses the following properties: it is a colourless, transparent liquid, of a pleasant smell, and a pungent taste, extremely exhilarating, producing a degree of intoxication when its vapour is inhaled by the nostrils. Its specific gravity is .750, but it may be procured as low as .700, and, according to some authors, still lower than this by distillation from chloride of calcium. Æther is extremely volatile, and when poured from one vessel to another, a considerable portion of it evaporates. During evaporation much cold is produced, as may be experienced by letting some fall on the hand. Or if we put some into a small glass vessel surrounded with cloth, and containing water, and after dipping it two or three times into æther, allow the æther after each immersion to evaporate, the water in the glass freezes by the cold produced. In the open air æther boils at 96°, and in a vacuum at 20° below zero; were it not, therefore, for the pressure of the atmosphere, it would always exist in the gaseous state. The density of the vapour of æther is to that of atmospheric air, about as 2.5844 to 1, consequently it is a very dense elastic fluid. Æther remains liquid even when exposed to a cold of 58° below zero, or 90° below the freezing point of water. It combines sparingly with water, but with alcohol in all proportions. Æther, and the vapour which rises from it, are very inflammable, and during combustion, water and carbonic acid are formed by the union of its hydrogen and carbon with the oxygen of the air. When æther is admitted to any gaseous body it increases its bulk, and with oxygen gas thus expanded, it produces an inflammable and very explosive mixture. When the vapour of æther is passed through a red hot porcelain tube it is decomposed. If a small portion of æther is put into chlorine gas, the gas is absorbed, and a peculiar compound is formed in which muriatic acid is perceptible; and if the æther be inflamed, charcoal is deposited, and muriatic acid gas is evolved. When a little æther is poured into a large jar of warm chlorine, it sometimes occasions considerable explosion, the force of which the jar should be strong enough to withstand.

The resins, several of the fixed, and almost all the volatile oils, are dissolved by æther; it dissolves a small portion of sulphur and of phosphorus: the latter solution becomes luminous in a dark room, when poured on the hands or on hot water. The fixed alkalies, potash and soda, are insoluble in æther, but readily soluble in alcohol, and upon this difference of power depends the process of separating these fluids as already described. When æther is added to a solution of gold or platina in an acid, the metals are dissolved by the æther, and the greater part of the acid is separated. These solutions have been employed for coating steel instruments so as to protect them from rust. Though the deposit formed upon the steel from a solution of gold is more beautiful, that yielded by platina is stated to be most effectual. The purpose, however, to which æther is principally applied is, that of a stimulant and antispasmodic.

To render intelligible the process of ætherification by sulphuric acid, it will be requisite to exhibit a comparative statement of the composition of

Alcohol		and Æther.	
Four atoms of carbon	6 × 4 = 24	Four atoms carbon	24
Two atoms of oxygen	8 × 2 = 16	One atom of oxygen	8
Six atoms of hydrogen	1 × 6 = 6	Five atoms of hydrogen	5
	46		37

It appears then that 37 parts of æther contain as much carbon as 46 of alcohol, and the difference between their composition will be shown, by the annexed view, to be derived from the separation of the elements of an atom of water from the alcohol.

	Carbon,		Oxygen,		Hydrogen.		
Alcohol	24	+	16	+	6	=	46
Æther	24	+	8	+	5	=	37
leaving			8	+	1	=	9 an atom of water.

It was supposed by MM. Fourcroy and Vauquelin, that in this process, as actually occurs in some others, the oxygen and hydrogen were separated from the alcohol by the direct action of the sulphuric acid, on account of its affinity for water, and although water is really formed in the operation, yet it has been shown by Mr. Hennell, that its production is not direct but intermediate;—he found that, when sulphuric acid is merely mixed with alcohol, a portion of the acid immediately undergoes great change of properties, by combining with the carbon and part of the hydrogen of the alcohol. The new compound thus formed was first accurately examined by Vogel; it is called sulphovinic acid, and consists of—

Two atoms of sulphuric acid	40 × 2 = 80
Four atoms of carbon	6 × 4 = 24
Four atoms of hydrogen	1 × 4 = 4
	108

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[*] In the chemical articles in this work the pound directed to be used is the avoirdupois, and the pint the imperial.

It will appear, from the annexed statement, that the formation of sulphuric acid is necessarily attended with that of water, thus :—

Carbon, Hydrogen, Oxygen.
Alcohol 24 + 6 + 16 = 46
Sulphuric acid 80 + 24 + 4 = 108 sulphovinic acid.
Consequently there remain 2 + 16 = 18 two atoms water.

When the sulphovinic acid is heated, decomposition ensues, and the sulphuric acid in its original state remains in the retort, while the carbon and hydrogen with which it constituted sulphovinic acid, combine with the elements of one of the two atoms of water formed from the alcohol, and æther results from their union, thus :—

Four atoms of carbon 6 × 4 = 24 } from the sulphovinic acid
Four atoms of hydrogen 1 × 4 = 4 } decomposed
One atom of hydrogen 1 }
One atom of oxygen 8 } from the water formed
One atom of æther 37

One atom of water, formed from the oxygen and hydrogen of the alcohol, remains in the retort with the sulphuric acid, which, although unchanged in its nature, is so weakened by this addition, that it cannot, in the second operation, form as much æther as in the first; on this account it will be observed that we have directed only half a pint of alcohol in the second, instead of a pint, as in the first distillation.

The elements which form æther may be regarded as existing in two modes of combination—first, as constituting a ternary compound of oxygen, hydrogen, and carbon; and secondly, as resulting from the union of two binary compounds, viz., water and bicarburetted hydrogen (olefiant gas): thus 8 parts of oxygen and 1 of hydrogen form 9 of water, and 24 of carbon + 4 of hydrogen constitute 28 of olefiant gas. Although it is entirely hypothetical, yet some plausibility is given to this view of the subject by comparing the specific gravity of the vapour of æther (which, as has been already stated, is nearly 2.5844) with that which would result from the condensation of one volume of the vapour of water and two volumes of olefiant gas into one volume; the specific gravity of this compound would by calculation be 2.569, which certainly comes very near the experimental specific gravity of the vapour of æther.

Sulphurous acid has been mentioned as arising during the action of the sulphuric acid and alcohol upon each other; and as its production is not accounted for in the explanation which has been given of the formation of æther, it is proper to state that it is an accidental and not a necessary result. When more sulphuric acid is used than is required to convert the alcohol into sulphovinic acid, the excess decomposes and is decomposed by the alcohol, so as to leave charcoal in the retort, and evolve sulphurous acid. Mr. Hennell found, after an operation in which the proportions of acid and alcohol had been nicely adjusted, that only 1-75th part of the sulphuric acid was lost, no charcoal was deposited in the retort, nor was any sulphurous acid evolved. Mr. Hennell also proved that sulphovinate of potash and sulphuric acid, if but little water was present, yielded æther, without using any alcohol; but if more water was employed, then the product was alcohol, without any æther.

Phosphoric æther is prepared by the action of phosphoric acid upon alcohol; the phosphoric acid appears to be converted into phosphovinic acid, as the sulphuric is into sulphovinic; the æther produced is precisely similar to sulphuric æther.

Arsenic acid also forms æther when distilled with alcohol; the acid probably undergoes changes similar to the sulphuric and phosphoric acids, and the resulting æther is of the same kind. (Lassaigne, *Annales de Chimie et de Phys.* t. xiii. p. 294.)

Thenard and Gay-Lussac (*Recherches Physico-Chimiques*, ii. 39) discovered that fluoboric acid and alcohol produced æther by their mutual action; the product is of the same nature as the foregoing, but the acid appears to abstract the elements of water from the alcohol by direct action, and without undergoing the changes suffered by the sulphuric, phosphoric, and arsenic acids: this, therefore, must be considered as the simplest case of the formation of æther.

It will be observed, that the acids which occasion the formation of the æthers already described do not enter at all into their composition; but in those now to be mentioned, *be ætherizing* medium generally forms a part of the product.

Chloric æther may be obtained by heating in a retort a mixture of 10 parts of alcohol, 10 of sulphuric acid, 13 of common salt, and 6 of peroxide of manganese; the distilled product is to be mixed with water, and the æther which floats on it is first to be washed with a weak solution of potash, and then with pure water. Chloric æther thus obtained is colourless, of an agreeable odour, and an acrid taste. Its specific gravity is 1·134. It boils at a lower temperature than water, is very combustible, burns with a green flame, yields muriatic acid during combustion, and leaves a residue of that acid after it. It is composed of 55·45 parts of chlorine and 44 55 of bicarburetted hydrogen in 100 parts. This æther is applied to no use.

Muriatic æther is prepared by distilling a mixture of strong muriatic acid and alcohol. It is colourless, and has a strong penetrating æthereal smell; its taste is slightly sweet; its specific gravity is ·774, according to Thenard, but other authorities make it heavier. It is extremely volatile, and consists of muriatic acid and the elements of olefiant gas. Although it does not redden litmus paper so as to evince the presence of an acid, yet when it is burnt a large quantity of muriatic acid is developed. Hydriodic and hydrobromic æther appear to be analogous in nature to muriatic æther; they are not applied to any use.

Nitric æther is prepared by distilling a mixture of equal weights of nitric acid and alcohol; the acid must be gradually added to the spirit, in order to prevent the violent action which would otherwise ensue. The distillation is to be carried on with a slow fire, and the product redistilled from lime. Its properties are, that it is of a yellowish colour, and quite neutral when freshly prepared, but it becomes acid by keeping; its smell is peculiar and æthereal, and its taste pungent. Its specific gravity about 0·886. It is extremely inflammable. MM. Dumas and Boullay state its composition to be equivalent to an atom of sulphuric æther + an atom of hyponitrous acid, or 100 parts consist of

Carbon	32·69
Azote	19·00
Hydrogen	6·88
Oxygen	41·43
	100

The acids of vegetable origin, as the acetic, benzoic, citric, gallic, oxalic, and tartaric, are capable of converting alcohol into æther, and they all enter into the composition of the æther which they form. The only one of any importance is the first named, viz. the acetic æther, and this only will be described. Acetic æther may be prepared in several modes, the following is, perhaps, one of the best:—put into a retort three parts of acetate of potash, three parts of alcohol, and two parts of sulphuric acid; distil to dryness, and mix the product with one-fifth of its weight of sulphuric acid, and distil with a gentle heat three parts of æther. This æther is colourless, it has a smell of sulphuric æther and acetic acid; it does not change litmus paper, its taste is quite peculiar, and its specific gravity is 0·866. It burns with a yellowish light, and acetic acid is developed. When mixed with potash and subjected to distillation, its odour and taste are lost, alcohol is condensed in the receiver, and acetate of potash remains in the retort. It is composed of

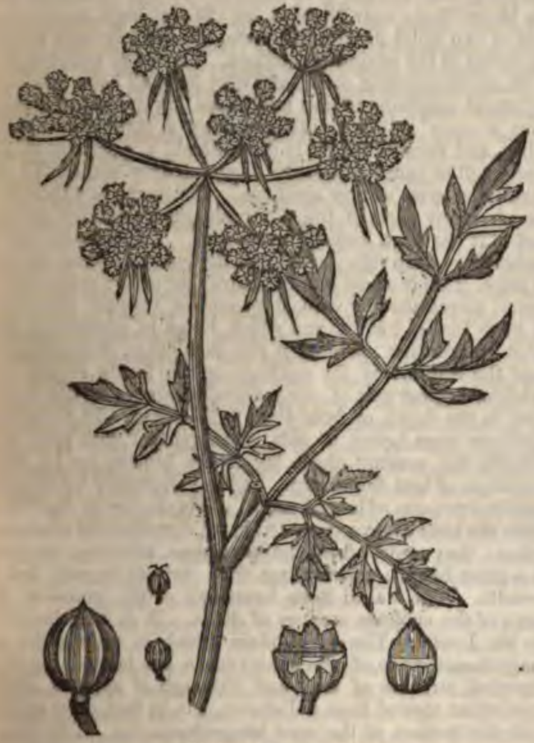
Carbon	54·65
Oxygen	36·28
Hydrogen	9·07
	100

It is sometimes, though rarely, used in medicine.

ÆTHIOPIA. [See ETHIOPIA.]

ÆTHU'SA is a genus belonging to the natural order Umbelliferæ, which includes among its species one of the most poisonous plants known in Europe. As many fatal accidents have occurred from the incautious use of its leaves, we shall give a minute description of it, for the purpose of enabling our readers to recognise it with certainty.

Æthusa Cynapium is a little annual plant, found commonly in gardens and fields, resembling the Common Parsley so much, that it has acquired the vulgar name of *Fool's Parsley*. From a taper whitish root arises an erect branchy stem, about a foot high, generally stained with purple near the ground. This is covered by finely cut shining leaves of a deep green, much resembling those of Garden Parsley, from which they are known thus: in the *true Parsley*, the leaves are twice pinnated or divided, and the leaflets are broad, and cut into three wedge-shaped toothed lobes; in the *Fool's Parsley*, on the other hand, the leaves are thrice pinnated, and the leaflets are narrow, sharper, and jagged; besides which, the leaves of Fool's Parsley have a disagreeable nauseous smell, instead of the fine aromatic odour of Common Parsley. When in flower, Æthusa has its principal umbels destitute of involucra, while the partial umbels are furnished with an involucrum, consisting of four or five narrow, sharp leaves, hanging down *from one side only* of the common stalk; this last circumstance will distinguish it when in flower, not only from parsley, but from all other British umbelliferous plants.



[Æthusa Cynapium.]

Many dangerous accidents have occurred from mistaking this plant for parsley. In one case, a person, who had eaten it with salad, died in little less than an hour; and in another of recent occurrence, the patient, although the stomach was emptied at a very early period, sank gradually, and died at the end of a few days. The symptoms attendant upon poisoning by Æthusa are, swimming of the head, nausea, cold perspiration, and chilliness at the extremities. To counteract its effects, emetics are recommended, and the immediate use of weak vegetable acids, such as lemon-juice, vinegar, or sour wine.

ÆTNA, a celebrated burning mountain, or volcano, in Sicily; it is situated in the north-eastern part of the island, close to the sea-coast, between the towns of Taormina and Catania, distant from one another twenty-five English miles, and is encircled on the north, west, and south by the rivers Alcantara and Simeto. It was called by the Arabs, after the conquest of the island, *Jebel en nar*, or 'Mountain of Fire:' the modern Sicilians call it Mongibello, which is evidently derived from the Italian *Monte* and the Arabic *Jebel*, both signifying mountain. The division of Sicily in which Ætna is situated is called Val Demone, in allusion to the popular notion that the mountain fires issue from the region of demons. It is the greatest volcano in southern Europe, and affords not only a most instructive field for studying that remarkable class of geological phenomena, but exhibits some of the most striking instances of the later revolutions which the crust of the earth has undergone, previous to the historical era; as well as of those changes which are in a constant state of progress, to a greater or less extent, on every part of the earth's surface. To convey a just idea of the structure of this remarkable mountain, it is necessary to begin with a brief sketch of the geological formation of the adjoining country. Sicily, and especially Ætna, has been described by many naturalists, but we are indebted to Mr. Lyell for the most comprehensive general views respecting this volcano, and his observations, from having been recently made, are more in accordance with the present state of science.*

The Val di Noto, or southern division of Sicily, is composed of a series of strata, belonging to what geologists term *the tertiary period;* that is, such as have been deposited while some of the species of animals now found in our seas were in existence; all the animal remains occurring in the strata that lie *under* the tertiary rocks belong to species of which there are now no living analogues. These strata in Sicily are associated with lavas and other volcanic products, but these last are not visibly connected with any source, as no volcanic vent exists in any part of the Val di Noto. The uppermost of the strata consist of limestone, full of shells, their united thickness being sometimes as much as 800 feet; beneath these comes a slaty sandy limestone with pebbles of limestone, then a blue marl containing numerous shells, called in Sicily *Creta*,—under that, a white laminated marl, and lowest of all, that is to say, the lowest discoverable, a blue clay containing much gypsum, sulphur, and sulphate of strontian, all of them often in beautiful crystals. The great limestone deposit is found at a considerable elevation in the very centre of the island, for the summit of the hill of Castro Giovanni, 3000 feet above the level of the sea, is composed of it. All the strata, except the lowest, abound in shells, and, what is truly remarkable, these shells, with very few exceptions, can be identified with species now living in the adjoining sea. Thus, as we find shells imbedded in the solid rock, at a height of 3000 feet above the Mediterranean, belonging to species inhabiting that sea at this moment, it follows, that those parts of Sicily must have been raised from the deep to that great elevation after the time when the Mediterranean became inhabited by many of the same species of animals as those now living in it. During the time that these strata were in the course of being deposited at the bottom of the sea, there must have been considerable volcanic activity in the same region, for layers of hard compact lava, and of that mixture of ashes and limestone called by the Italians *tufo* and *peperino*, are interposed between the calcareous and clay strata; and after the whole series had been consolidated, the mass must have been violently rent asunder, for there are cracks that traverse all the beds, and these are filled with hard lavas, presenting those appearances called *dykes* by geologists. That these strata were deposited gradually, and that long intervals occurred between the volcanic eruptions, is proved by the following remarkable fact. In the neighbourhood of Vizzini, which is twenty-five miles in the interior of the island, Mr. Lyell observed a bed of oysters, identifiable with our common eatable species, no less than twenty feet in thickness, resting on a current of lava, and covered by a second mass of lava and peperino.

The Val di Noto is separated from the Val Demone and the region of Ætna by the extensive plain of Catania, which is watered by the Simeto and its tributary streams. On the northern side of the plain, as we approach Ætna, we discover a low line of hills, which are composed of the *inferior* clay stratum of the Val di Noto, and the same argillaceous formation may be traced round the base of the mountain on the south and east, the strata dipping in various directions, sometimes *towards* the mountain, so that, in their prolongation, they would lie under the volcano. These sub-Ætnean strata do not rise in any part to a greater elevation than 1000 feet above the sea, and are usually much lower: in some places they are 300 feet thick without any mixture of volcanic matter; in others, as in the vicinity of Catania, they are composed of volcanic tufo, thinly laminated, and form there a steep inland cliff from 600 to 800 feet high, separated from the sea by a low flat, composed of recent lava and volcanic sand. The sea-cliffs, northward of Catania, are formed of the same sub-Ætnean marine strata, as are the rocky islands lying off this coast, the Faraglioni, the celebrated Cyclopean islands, hurled by Polyphemus against Ulysses and his crew. The largest of these is 200 yards from the land, about 300 in circumference, and 200 feet in height, and is formed of strata of marl resting on a mass of lava, in regular basaltic columns, like the Giant's Causeway in Ireland, or Fingal's Cave in Staffa. This lava appears to have heaved up the stratified marly clay, for it is contorted in the most extraordinary manner, and is in some places hardened by the action of heat. These islands, therefore, have not been formed, as has been sometimes supposed, by a stream of lava from Ætna, for the lava of the islands underlies a stratum which underlies the volcano.

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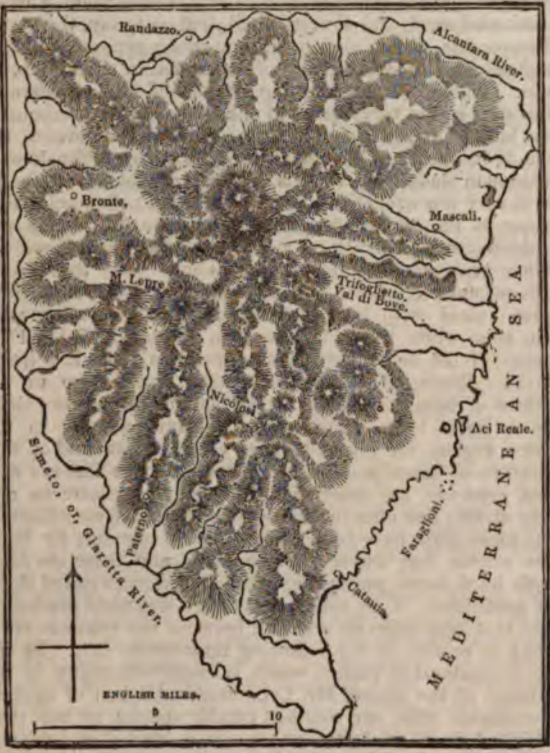
* A considerable part of our information is derived from the third volume of the *Principles of Geology*, which, perhaps, may not be published when this article appears. The author liberally permitted us to refer to the printed sheets.

Such, therefore, is the nature of the soil from out of which the stupendous volcano has arisen. Whether it has been formed by successive eruptions subsequently to the elevation of Sicily above the level of the sea, the observations hitherto made do not enable us to decide; it is more probable that it was partly formed prior to that elevation, and rose at the same time; and it may have projected as a cone from the surface of the water, vomiting forth volcanic matter, as Stromboli now does. But this will be better understood when we have described the structure of the volcano as it now presents itself, and have given an account of some of the most remarkable eruptions.



[Plan of Ætna, from Captain Smyth's survey.]

The base of Ætna covers an area of nearly ninety miles in circumference, and, according to the late measurement of Captain Smyth, the highest point is 10,874 feet above the level of the sea. Owing to this great elevation, the higher parts of the mountain have a climate almost as different from the valleys at its foot, as are the polar from the equatorial regions; and from this cause, together with the difference in the nature of the soil, there are three great natural divisions or zones in the mountain, the fertile, the woody, and the desert. The lowest is called the *Parte Piemontese*, merely expressing that it lies at the foot of the mountain: it is a beautiful, rich, and populous country, covered with luxuriant fields of corn, vines, and fruit trees. The limit cannot be very well defined, as it insensibly blends with the next, the *Regione Selvosa*, or the woody, which is covered by immense forests of chestnuts, oaks, beeches, and pines, forming a zone six or seven miles in width, the superior limit being about 6300 feet above the sea. The third and highest region, called the *Parte Scoperta*, the bare or desert, rises nearly 4600 feet higher. About 1100 feet from the summit there is an irregular plain, which, when Sir W. Hamilton visited it, about sixty years ago, was estimated to be nine miles in circumference, and from this plain rises the steep terminating cone, at the summit of which is the great crater or opening, continually throwing out sulphureous vapours. The dimensions of the crater have been very variously stated by different travellers, the circumference from two and a half to four miles, and the depth from 600 to 800 feet; but the height of the cone, the diameter of the crater and its depth, are liable to constant change from the eruptions. The cone has more than *once fallen* in and been reproduced: in the year 1444 it was 320 feet high, and fell in after the earthquake of 1537. In 1693, when a violent earthquake shook the whole of Sicily and killed 60,000 persons, the cone lost so much of its height, that it could not be seen from several places in Val Demone, where it was before visible. Although, taken as a whole, Ætna forms a cone which is in general of a very symmetrical form, when examined in detail it is found to be studded on its flanks, and particularly in the woody region, with numerous minor cones; small when compared with the great mass, but of a magnitude that would make them rank as mountains, if detached. One of the largest, called Monte Minardo, near Bronte, is upwards of 700 feet in height, and the Monti Rossi near Nicolosi are 450 feet high, and have a base of two miles in circumference, although ranked among the cones of the second magnitude. There are about eighty of these considerable cones, and they have all been produced by lateral eruptions of lava and ashes. By subsequent eruptions a cone is often surrounded by a lava stream or by ashes, and thus its height is diminished: a repetition of the process often causes its entire disappearance under the accumulated mass of new ejections. The sections exposed to view in many parts of the mountain show that the greater part of it has been formed in this way. The eastern side is broken by a deep valley of colossal dimensions, called the *Val di Bove*. This is a vast amphitheatre four or five miles in diameter, surrounded by vertical precipices, varying from 1000 to 3000 feet in height, and which, taken in connexion with other valleys that lead into it and each other, descends from near the summit to the confines of the fertile region, and exhibits a great part of the internal structure of the mountain, to the depth of from 4000 to 5000 feet. In these sections are seen layers of tufo interstratified with lava, and, towards the summit, these layers are broken up by fresh eruptions of lava from below, and are disturbed by the successive intrusion of lateral cones. We also see in the Val di Bove the beds of lava traversed in all directions by enormous dykes: they project from the precipices, towering vertically to a great height, and varying from two to twenty feet in breadth. The Val di Bove forms one of the grandest features of the sublime scenery of Ætna. It is thus described by Mr. Lyell: 'The great plain which is inclosed by the magnificent circle of precipitous rocks has been deluged by repeated streams of lava, and although it appears almost level when viewed from a distance, it is, in fact, more uneven than the surface of the most tempestuous sea. The face of the precipices is broken in the most picturesque manner by the vertical walls of lava which traverse them. These masses usually stand out in relief, are exceedingly diversified in form, and often of immense altitude. In the autumn, their black outline may often be seen relieved by clouds of fleecy vapour which settle behind them, and do not disperse until mid-day, continuing to fill the valley while the sun is shining on every other part of Sicily, and on the higher regions of Ætna. An unusual silence prevails, for there are no torrents dashing from the rocks, nor any movement of running water in this valley, such as may almost invariably be heard in mountainous regions. Every drop of water that falls from the heavens, or flows from the melting snow and ice, is instantly absorbed by the porous lava; and such is the dearth of springs, that the herdsman is obliged to supply his flocks during the hot season from masses of snow laid up in hollows of the mountain during winter. The strips of green herbage and forest land, which have here and there escaped the burning lavas, serve, by contrast, to heighten the desolation of the scene. When I visited the valley, nine years after the eruption of 1819, I saw hundreds of trees, or rather the white skeletons of trees, on the borders of the black lava, the trunks and branches being all leafless, and deprived of their bark, by the scorching heat emitted from the melted rock. This vast cavity in the mountain has none of the characters of a crater, but has probably been produced by a combination of different causes: by great subsidences, by lateral explosions, and by the great floods by which, even in historical times, it has been known to have been devastated, when a fiery torrent of lava had suddenly overflowed a great depth of snow in winter. The phenomena of the Val di Bove, as well as the position of the sub-Ætnean strata, are quite at variance with Von Buch's theory of the elevation of volcanoes from *craters of elevation;* a theory which, like another of that celebrated geologist, has not stood the test of rigid examination, and which has been too hastily adopted by many eminent naturalists, from the faith we are naturally inclined to repose in an authority, which we know to be entitled to great respect.

The records of history supply no materials from which we can arrive at any knowledge of the gradual growth of the mountain, for the additions to it from the accumulated produce of all the eruptions that have taken place within the period of history, great as they are, become quite insignificant when contrasted with the entire mass of the volcano. But if we compare the time that has elapsed since that comparatively thin covering began to be formed, with that which must have been required to produce, by a similar process, the remaining part, we shall form the most exalted notions of its remote antiquity. We have no ground for supposing that the altitude of Ætna has materially varied within the last 2000 years. Of the eighty most conspicuous lateral cones, not one of the largest has been produced within the period of authentic history. Every eruption does not produce a lateral cone, for one in three takes place from the crater at the summit; also when an opening is made in the flanks, a cone is not always produced, and many eruptions must have taken place from the sides, besides those which raised the eighty cones above-mentioned. We know, also, that there have been great intervals of rest between the eruptions, almost a century in some instances; so that, according to all probability, we must date the origin of the earliest of these cones, some thousand years prior to the historical era. But we may reasonably carry our views of the antiquity of the volcano much beyond even that remote date. If we were to remove the whole of the cones as well as the entire matter which has been ejected from them and from the highest crater during the period of their growth, we should cut off several miles of the diameter of Ætna at its base, and diminish its elevation by some hundred feet; but we should still leave a mountain more lofty than any other in Sicily. That stupendous mass of volcanic matter must have been ejected subsequently to the formation of stratified rocks containing the remains of animals identifiable with those now living in the adjoining seas; rocks, be it remembered, among the most recent of the whole series of strata of which the crust of the earth is composed.

There are not more than sixty eruptions recorded in history, from the earliest to the present times. Of these, ten happened before the Christian era, twelve in the next fifteen hundred years, seventeen during the sixteenth and seventeenth centuries, and twenty-one from that time to the present; the most recent having taken place in November, 1832. The most remarkable would alone be noticed, and it is probable that many occurred in the second period of which we have no record; although a cessation for the whole period of fifteen hundred years would be in no degree at variance with the history of other and neighbouring volcanoes, for the island of Ischia enjoyed an interval of repose from the devastation of its internal fires for seventeen centuries. Diodorus Siculus (lib. v. c. 2.) speaks of old eruptions of Ætna, said to have taken place long before the Trojan war, and to have occasioned the emigration of the Sicani, the earliest inhabitants of the island, who were afterwards replaced by the Siculi from Italy. An eruption is recorded to have occurred in the time of Pythagoras, who is believed to have died 496 B.C. Another took place 475 B.C., and it is to this eruption that Æschylus and Pindar most probably allude, the one in his play of Prometheus, the other in the following passage of his first Pythian ode.—It was a poetical fiction or a popular superstition that the great giant Typhos was buried beneath Sicily, and, according to Pindar, the outstretched monster spread as far as the volcanic regions about Cuma and Naples.

‘The sea-girt heights above Cuma, and Sicily too, press upon his shaggy breast; and the pillar of heaven, snowy Ætna, the perennial nurse of sharp pinching snow, holds him fast. From the recesses of Ætna are vomited forth the purest streams of fire, immeasurable in extent. By day the fiery current pours forth a burning torrent of smoke, but by night, the red flame, rolling along masses of rock, plunges them with loud crash into the surface of the sea. That monster sends up such horrid streams of Hephæstus (Vulcan)—a sight wonderful to look on; wonderful, too, to hear of from those who have seen it.’

An eruption is mentioned by Thucydides 425 B.C., which did some damage to the lands of Catana, as Catania was then called; and he adds, that this was the third eruption of lava on record since the Greeks had been settled in Sicily. Diodorus Siculus (lib. xiv.) mentions an eruption 396 B.C. which stopped the Carthaginian army in their march from Messina to Syracuse, and obliged them to go round the whole base of the mountain in order to reach Catania. This stream of lava may be seen on the eastern slope of the mountain near Giarre, extending over a breadth of more than two miles, and having a length of twenty-four from the summit of the mountain to its final termination in the sea. There are similar notices of later eruptions which we do not think it necessary to particularize; for a mere list of dates would afford no interest to the general reader, and there is such a similarity in the phenomena, varying only in intensity, that it would be tedious and unprofitable to give a description of the several instances of activity in the volcano. We shall content ourselves with a notice of some of the most remarkable eruptions of which detailed accounts have been preserved. In 1537, after violent rains and great devastations occasioned by the flooding of the river Simeto, Ætna was rent in several places, and from the openings there poured forth deluges of liquid lava. They directed their course towards the monastery of St. Nicholas d'Arena, destroyed the gardens and vineyards, and proceeding towards Nicolosi burnt two villages and destroyed most of the inhabitants. When the conflagration ceased, the summit of the mountain sunk in with a terrific noise. These agitations of the mountain continued throughout the whole year. The smoke, noise, and shocks of earthquakes affected the whole island. In 1669 an earthquake had levelled to the ground all the houses in Nicolosi, a town situated near the lower margin of the woody region, about twenty miles from the summit of Ætna, and ten from the sea at Catania. Two gulfs then opened near that town from whence sand and scoriæ were thrown up to such an amount, that, in the course of three or four months, the double cone we have mentioned in a previous part of this article, called Monti Rossi, was formed. It is about 450 feet high, and two miles in circumference.

In the plain of S. Lio, a fissure six feet broad and of unknown depth opened with a loud crash, and ran in a somewhat tortuous course to within a mile of the summit of Ætna, traversing a length of twelve miles, and emitting a most vivid light. Five other parallel fissures of considerable length opened one after the other, and sent forth smoke and bellowing sounds, which were heard at the distance of forty miles. The light emitted from the great rent of S. Lio appears to indicate that it was filled to a certain elevation with incandescent lava, probably to the height of an orifice not far distant from Monti Rossi, which at that time opened and poured out a lava current. This stream, after overflowing fourteen towns and villages, some with a population of between 3000 and 4000 inhabitants, at last reached the walls of Catania, which had been purposely raised to protect the city; but the burning flood accumulated till it rose to the top of the rampart, which was sixty feet in height, and then fell in a fiery cascade and overwhelmed a part of the city. The wall, however, was not thrown down, and the solid lava may still be seen curling over the top of the rampart like a cascade in the act of falling. This great current had performed a course of fifteen miles before it entered the sea, where it was still 600 yards broad and forty feet deep.

The eruption of 1792 is thus described by Ferrara:—On the first days of March the mountain emitted thick clouds of smoke, and at night flames were seen to rise to a considerable height. On the 8th it shook violently, and for several days awful roarings were heard, which appeared to proceed from the innermost cavities of Ætna. During April the mountain was tolerably quiet, except that smoke and flames were occasionally seen issuing from its summit. In the beginning of May immense masses of smoke rose in perpendicular columns, and on the 11th lava was seen to flow from the great crater. Meantime shocks of an earthquake were felt at Messina; and on the morning of the 12th the internal roaring was repeated, the black smoke rose in the air in the shape of a gigantic tree, spreading its top to an immense extent around, and in the midst of these dense masses of black smoke were seen numerous globes of white smoke as fleecy as cotton. Towards eleven o'clock A.M. of that day, an explosion, like the discharge of heavy artillery, was heard and felt all around the base of Ætna, followed by a hollow rumbling noise, and the black smoke arose with fresh violence. In the evening the lava flowed down the sides of the mountain in several streams, one westward towards Aderno, and another ran to the south-east into the valley of Trifoglietto, and stopped at Zoccolaro, ten miles from the crater. On the 13th, the mountain became more quiet, and remained so till the 23rd, only sending forth a shower of ashes and hot sand, which fell all around its sides. On the 23rd the black smoke re-appeared; and the next day a new mouth opened itself in the plain Del Lago, about three miles south-east of the great crater, and from it, for several days, blocks of old lava and scoriæ were thrown to a great height, as well as masses of clay, moist and soft. On the 26th, another mouth opened in the same direction, and vomited a stream of lava which fell into the valley of Trifoglietto, and soon after all the old lava cliffs above tumbled down, and nearly filled the valley. On the 1st of June, a large mouth opened itself half-way up the southern side of the cone of the mountain, on the heights called Del Solfizio, facing Catania, and from it a huge torrent of lava issued forth, ran down the immediate slope beneath, then, turning eastward, rushed against the base of Mount Arcimisa, one of the numerous conical hills which rise round Ætna. The stream was then forced round into a valley 400 feet deep which had been formed by the waters, and which sloped down to the eastward into the cultivated plain and the vineyards. The lava soon filled up the valley, where it began to harden; but the liquid stream from the heights still pouring in pressed against it, so that now and then an enormous mass of half-hardened lava would detach itself, and having slidden some distance down the declivity would break up with a tremendous crash into a thousand fragments, and cover a fresh extent of ground. The lava stream covered, in this manner, the vineyards of Zaffarana, and approached the village of that name, when it fortunately stopped close to the houses from whence the inhabitants were all ready to fly. The sight is described by Ferrara as extremely awful and grand, especially by night. The eruption continued for a whole year, till May, 1793. The stream of lava, in its fluid state, was often thirty feet high. The lava that flowed first cooled, and became condensed at a certain distance, and thus formed a dyke against the current of fresh lava which swelled up and overflowed its own bed, increasing in height at every fresh overflowing. Thus in many places strata of lava have been formed more than 300 feet high. The stream of lava sweeps the ground on which it flows, carrying along with it the earth, stones, trees, and other substances which it finds in its passage. At a short distance from the mouth the lava becomes covered with a crust of scoriæ, which increases in thickness progressively, the lower part of the stream continuing to flow underneath like a liquid paste. The scoriæ sometimes form bridges over the fiery stream sufficiently strong to bear a person.

In 1819, three large mouths or caverns opened very near those formed in an eruption eight years before, from which flames, red-hot cinders, and sand were thrown up, with loud explosions. A few minutes afterwards another mouth opened below, from which flames and smoke issued; and finally, a fifth, lower still, from whence a current of lava flowed, which spread itself with great velocity over the Val di Bove. The three original mouths at length united into one large crater, and sent forth lava, as did the inferior apertures, so that an enormous torrent poured down the great valley. When it arrived at a vast, and almost perpendicular precipice, at the head of the valley of Calauna, it poured over in a cascade, and, being hardened in its descent, made a tremendous crash as it was dashed against the bottom. So immense was the column of dust raised by the abrasion of the tufaceous hill over which the hardened mass descended, that the Catanians were in great alarm, supposing a new eruption to have burst forth in the woody region, exceeding in violence that near the summit of Ætna.

The following account of the eruption in the beginning of November, 1832, is by Professor Gemmellaro, of Catania, whose letter is dated the 15th of November. 'On the 31st of October, at half past two in the afternoon, several tremblings of the earth, accompanied with fearful subterranean noises in the woody region of Ætna, announced an eruption; but as the mountain was enveloped in clouds, the place could not be exactly ascertained. In the middle of the night, however. it appeared very evident that the volcano had broken out in two places, one of which was at the foot of the highest cone towards the S.W., at a height of 9300 feet. From several small orifices of the crater, ashes, sand, and cinders were thrown out; and one of them poured forth an inconsiderable stream of lava, in the direction of the Casa Gemmellaro, but the old lava stream of 1787 served as a dyke, and caused it to change its direction. The lava now flowed into the valley of Trifoglietto, towards the Cone San Simone (eruption of 1811), the distance it had travelled from its source being about two miles. But these appearances were of minor importance, in comparison with an eruption which took place in the neighbourhood of Monte Lepre, N. W. of the crater, eight miles distant from Bronte, and at an elevation of 6200 feet in the upper part of the woody region, near where it ends. Here four mouths of fire were opened, out of which, not only ashes, sand, and cinders, were projected to a vast height, but also enormous red-hot masses: the earth shook during these catastrophes without ceasing, and the subterranean noises were fearful. The explosions from the highest of the openings were very powerful, and continued without intermission. A pillar of flame rose to the height of 120 feet, which, falling at some distance, formed an arch of fire; and what was particularly remarkable, there was a dark blue stripe which rose upwards to a great height, and was a constant accompaniment of the eruption for several days. The four other mouths were not less active a stream of lava burst forth from the lowest of them, which now threatens to be fearfully destructive: in five days it extended to the distance of four miles; it threatened first the woods of Maretto, but turned afterwards to those of Bronte. In the course of its rapid descent, the lava soon began to spread itself over cultivated fields, and did considerable damage: it is at this time only three miles distant from Bronte, a town of 13,000 inhabitants, which it threatens with destruction. The terrified inhabitants see the most dreadful fate awaiting them; part have fled in the greatest despair, others have been endeavouring, like the people of Catania at the time of the terrible explosion of 1669, to make the lava stream take another direction, but it is impossible to approach it within a quarter of a mile. At the moment I am closing this letter, I am told that the lava is within two miles of Bronte, and that to-morrow night the fate of the unhappy town will be decided; for the stream has reached a point from which it must either flow into a side valley, or inevitably overflow Bronte. On the 11th of this month, the five mouths united into one, the violence of the eruption increased, and the quantity of ashes and cinders thrown out was enormous; the finest ashes have been carried as far as this place. The lava is augitic, and contains very few crystals; the cinders are light, spongy, and half-vitrified.' The distance of Catania from Bronte is twenty-five miles in a direct line. Happily, the destruction of Bronte has, for the present, been averted, for we learn by a letter dated the 22nd of Nov., the following further particulars. 'On the 16th, the alarm of the inhabitants began to diminish. Nothing could be more terrific than the first appearance. A stream of lava, dividing itself into two branches, eighteen miles long, including all its windings, a mile broad, and thirty feet high, threatened to overwhelm the defenceless land. There was also a great alarm lest it should fall into the bed of the Simeto, and cause a frightful inundation of the neighbouring country. The greater part of the lava has poured into a large gulf previously opened, and the earthquakes have ceased. A new cone has been thrown up, similar to those around the flanks of Ætna, which attest its former eruptions. The town of Bronte has been saved, no lives have been lost, and altogether the damage done is less than was at first apprehended."

For more than half the year, the upper part of the mountain is covered with snow; and it forms the great store from whence Sicily and Malta are supplied in summer with that necessary of life in a hot climate, yielding a considerable revenue to the bishop of the diocese, and constituting a great article of commerce. 'A remarkable discovery,' says Mr. Lyell, 'has lately been made on Ætna, of a great mass of ice, preserved for many years, perhaps for centuries, from melting, by the singular accident of a current of red-hot lava having flowed over it. The following are the facts in attestation of a phenomenon which must at first sight appear of so paradoxical a character. The extraordinary heat experienced in the south of Europe during the summer and autumn of 1828 caused the supplies of snow and ice which had been preserved in the spring of that year, for the use of Catania and the adjoining parts of Sicily, and the island of Malta, to fail entirely. Great distress was felt for the want of a commodity regarded in these countries as one of the necessaries of life, rather than as an article of luxury, and on the abundance of which, in the large cities of Sicily, the salubrity of the water, and the general health of the community, are said in some degree to depend. The magistrates of Catania applied to Signor M. Gemmellaro, in the hope that his local knowledge of Ætna might enable him to point out some crevice or natural grotto on the mountain where drift snow was still preserved. Nor were they disappointed; for he had long suspected that a mass of perennial ice at the foot of the highest cone was part of a large and continuous glacier covered by a lava current. Having procured a large body of workmen, he quarried into this ice, and proved the superposition of the lava for several hundred yards, so as completely to satisfy himself that nothing but the subsequent flowing of the lava over the ice could account for the position of the glacier.' Mr. Lyell thus accounts for this extraordinary phenomenon. 'We may suppose that, at the commencement of the eruption, a deep mass of drift snow had been covered by volcanic sand, showered down upon it before the descent of the lava. A dense stratum of this fine dust, mixed with scoriæ, is well known to be an excellent non-conductor of heat: the shepherds in the higher regions of Ætna are accustomed to provide water for their flocks during summer, by strewing a layer of volcanic sand a few inches thick over the snow, which effectually prevents the sun from penetrating. Suppose the mass of snow to have been preserved from liquefaction until the lower part of the lava had consolidated, we may then readily conceive, that a glacier thus protected at the height of 10,000 feet above the level of the sea would endure as long as the snows of Mont Blanc, unless melted by volcanic heat from below.'

Every one is aware that, in lofty mountains, the temperature of the air diminishes as the elevation increases, and that even under the equator there are regions of eternal snow. So in Ætna, he who ascends from the sea-shore to the summit, passes through all the gradations of climate which he would meet with, were he travelling from the country of the date and the sugar-cane to the arctic circle. His own feelings would not enable him accurately to mark the transitions, but the botanist can trace the lines of separation, drawn by the hand of Nature, with unerring precision. We have said that Ætna is divided into three regions, the fertile, the woody, and the desert; these zones are defined by the presence or absence of certain great classes of the vegetable kingdom, but each of them is susceptible of subdivisions, determined by the constitutions of certain families of plants, which can only thrive within certain limited ranges of temperature; and thus the mountain is divisible into seven distinct *botanical* regions. We can mention only a few of the plants that are characteristic of each, and must refer the reader for fuller details to special works on the subject.

The *first*, or what may be termed the sub-tropical region, does not rise more than one hundred feet above the level of the sea. Here grow the palm-tree (*Phœnix*), the banana (*Musa*), the Indian fig, or prickly-pear (*Cactus opuntia*), and the sugar-cane; and there may be seen in open gardens tree-cacaliæ, and euphorbiæ, together with varieties of mimosa and acacia, which, in the northern parts of Europe, are nursed in our hot-houses and conservatories. The *second*, or hilly region, extends to the height of about 2000 feet, where the culture of the vine ceases. Here we find many plants of the South of France, Spain, and Italy, and cotton, maize, the orange, the lemon, and the shaddock. From the great dryness of the atmosphere, mosses and lichens are extremely rare, and the mushroom tribe (*fungi*) are only met with in winter. The *third*, or woody zone, lies between the elevations of 2000 and 4000 feet: it is the region of the cork-tree (*Quercus suber*), and other kinds of oak (*Q. pedunculata*, *Q. robur*, *Q. congesta*), the maple (*Acer*), and, especially on the eastern side, of luxuriant chestnut-trees, often of extraordinary size. The *fourth* region, which lies between the elevations of 4000 and 6000 feet, is characterized by the presence of the beech (*Fagus sylvestris*), Scotch fir (*Pinus sylvestris*), birch (*Betula alba*), and, among small plants, clover (*Trifolium roseum*), sandwort (*Arenaria condensata*), mouse-ear chickweed (*Cerastium album*), dock (*Rumex arifolius*), and plantain (*Plantago victorialis*). The *fifth*, or sub-alpine region, lies between the elevations of 6000 and 7500 feet, and produces the barberry (*Berberis ætnensis*), soap-wort (*Saponaria depressa*), toad-flax (*Linaria purpurea*), and juniper (*Juniperus hemisphærica*). The *sixth* region lies between the elevations of 7500 and 9000 feet. With the exception of *Berberis ætnensis*, *Astragalus siculus*, and *Juniperus hemisphærica*, almost all the plants of the fifth region are also found in this; but the *Saponaria depressa*, the *Rumex ætnensis*, and the fleshy and jagged groundsel (*Senecio carnosus* and *S. incisus*), are characteristic of it. The *seventh* region is very narrow, its upper limit not rising above 9200 feet; and it only produces a few lichens, among which the *Stereocaulon paschale* is the most common. Beyond that elevation utter sterility prevails.

It is very remarkable that the Flora of Sicily produces scarcely any, if any, peculiar indigenous species, the plants being common, almost without exception, to Italy or Africa, or some of the countries surrounding the Mediterranean, whereas there are several indigenous plants in Corsica and some other Mediterranean islands. Mr. Lyell supposes the plants of Sicily to have migrated from pre-existing lands; and, as the remains of living species of shell-fish and zoophytes are found imbedded in the strata at the summits of lofty mountains in the island, he brings us to this curious result, that the families of plants and animals of the Val di Noto, and some other mountainous regions of Sicily, are of higher antiquity than the country itself; that is, that these species flourished elsewhere before the island was raised from the depths of the sea, and even before the materials of its strata were deposited beneath the waters.

We cannot allude, even thus briefly, to the vegetable productions, of Ætna, without noticing the gigantic chestnut-tree,—one of the most celebrated wonders of the island; it occurs in the third region, and is known by the name of the *Castagno de Cento Cavalli*, because it is said to be capable of sheltering a hundred horses under its boughs. It appears to consist of five large and two smaller trees, which, from the circumstance of the barks and boughs being all outside, are considered to have been one trunk originally. The largest trunk is thirty-eight feet in circumference, and the circuit of the whole five, measured just above the ground, is one hundred and sixty-three feet. It still bears rich foliage, and much small fruit, though the heart of the trunk is decayed, and a public road leads through it wide enough for two coaches to drive abreast. In the middle cavity a hut is built for the accommodation of those who collect and preserve the chestnuts.

This is said, by the natives, to be 'the oldest of trees.' From the state of decay, it is impossible to have recourse to the usual mode of estimating the age of trees by counting the concentric rings of annual growth, and therefore no exact number of years can be assigned to the age of this individual. That it may be some thousand years old is by no means improbable. Adanson examined in this manner a Baobab tree (*Adansonia digitata*) in Senegal, and inferred that it had attained the age of five thousand one hundred and fifty years; and De Candolle considers it not improbable that the celebrated Taxodium of Chapultopec, in Mexico (*Cupressus disticha*, Linn.), which is one hundred and seventeen feet in circumference, may be still more aged.

The ascent of Ætna is a work of great fatigue, especially in the upper or desert region, both on account of the heat and of the feet sinking and receding at every step in the loose ashes. But under favourable circumstances of weather, the labour is amply rewarded by the magnificence of the vast prospect, varied as it is by the view of Sicily itself, spread out like a map, by the islands with which the surrounding sea is studded, Stromboli pouring forth volumes of smoke, and by the distant shores of Italy. If to this we add the grandeur of the scenery of the mountain itself, so diversified and majestic in all its features, the splendour of the heavens at night, and of the rising of the morning sun, the whole presents a combination perhaps not to be found on any other spot of the earth. The best accounts of Ætna are to be found in the following works: Ferrara, *Descrizione dell' Etna; Palermo.*—1818. Gemmellaro, *Quadro Istorico dell' Etna*, 1824. Daubeney, *On Volcanos*, 1826. Scrope, *On Volcanos*, and *Principles of Geology*, by Charles Lyell, 1832,3; and for the botany of Ætna, Presl, *Flora Sicula*, Prague, 1826.

ÆTO'LIA, according to the ancient geographers, consisted of two chief divisions, one on the coast, extending from the mouth of the Achelous eastwards along the north shore of the Corinthian gulf as far as its narrow entrance at Antirrhium—the other, called Epiktetos, or the acquired, was the northern and mountainous part. The length of sea-coast, as Strabo incorrectly gives it, from the mouth of the Achelous to Antirrhium, is 210 stadia, or about 21 miles: the same line of coast, according to the best modern charts, is about 42 miles, measuring in straight lines from one projecting point to another. If the great recesses of the sea about Anatolico and Mesolunghi were included, the distance would be much greater. The south-eastern boundary of Ætolia, which separated the province from that of the Locri Ozolæ, was a mountain range named Chalcis, afterwards, in its north-eastern course, taking the name of Corax. The north and extreme north-eastern boundaries of Ætolia were the small territory of Doris, the branches of Pindus, and part of the western line of Œta; but as no ancient geographer has given anything like a definite boundary to Ætolia, and as we are still only imperfectly acquainted with the mountains of northern Greece, any further description is impossible. The western boundary was the Achelous. [See ACARNANIA.]

The only considerable river of Ætolia, besides the Achelous, is the *Fidari*, formerly the Evenus, which rises in the N.E. part of Ætolia, in the range of Corax, which is some distance south of the great chain of Pindus. Its course is south, inclining in its lower course considerably to the west. Ætolia contains several lakes in the interior, two of which, as they are marked in our maps, communicate with one another and with the Achelous; but there is some difficulty in identifying these with the lakes mentioned by the ancient geographers and historians. Indeed, nearly the whole ancient and modern geography of central Ætolia is one heap of confusion. One of the lakes is called in our maps *Angelo Castro*, and the other *Vrachori*.

The principal ancient positions in Ætolia were, Thermum, in the interior; Trichonium, on the lake Trichonis, now *Vrachori;* Calydon, the oldest establishment of the Ætolians, and Antirrhium, at the entrance of the Corinthian gulf.

The Leleges in the north, and the Curetes, probably a kindred race, in the level plains of the south, are the oldest inhabitants of this country that we can trace. The name of Ætolia and Ætolians was introduced, according to tradition, by Ætolus and his followers from Elis, in the Peloponnesus, six generations before the war of Troy. In course of time the original inhabitants and the strangers formed one people, and increased by the intermixture of Æolians and Bœotians from Thessaly, they became in part, though not altogether, a Grecian people. In the time of Thucydides, one of the most numerous divisions of the Ætolian nation was characterized by that writer as 'speaking a language not understood, and being in the habit of eating raw flesh.' [Thucyd. iii. 94.]

The history of the Ætolians, as a nation, is closely connected with that of the Acarnanians, but, like the latter, they were a people of little importance during the most flourishing periods of the commonwealths of European Greece. After the death of Alexander the Great, B.C. 323, they came into notice by their contests with the Macedonian princes, who allied themselves with the Acarnanians. In the reign of Philip II. of Macedon, (which commenced B.C. 220,) the Ætolians, after seeing their chief town, Thermum, plundered by this king, and feeling themselves aggrieved by the loss of all they had seized from the Acarnanians, applied to the consul Valerius Lævinus. (B.C. 210.) Though this produced no beneficial effects, they formed a second treaty with the Romans (about B.C. 198) after the end of the second Punic war. The immediate object of the Romans was the conquest of Macedonia, but it proved eventually that this fatal alliance of the Ætolians was the first step that led to the complete subjugation of all Greece by the Romans. A series of sufferings and degradations led the way to the occupation of all Ætolia, when it was made part of the Roman province of Achæa. Under Roman dominion, the few towns of Ætolia almost disappeared: many of the inhabitants were transplanted to people the city of Nicopolis, which Augustus built at the entrance of the Ambracian gulf, opposite Actium, where he had defeated Antony. Since the time of the Romans it is probable that the face of this country has undergone as few alterations, or received as few improvements from the hand of man, as the most remote parts of the globe. The Romans themselves under the emperors had not even a road through Acarnania and Ætolia, but followed the coast from Nicopolis to the mouth of the Achelous.

Under the Turkish empire, Ætolia was partly in the province of Livadia. According to the original arrangements, only the part east of the Achelous and south of the two great lakes, was to belong to the new kingdom of Greece, but these boundaries are now extended towards the north and west, as far as the gulf of Arta.

The earliest traditions of Ætolia, properly known by that name, speak of a monarchical form of government under Ætolus and his successors; but this form of government ceased at a period earlier than any to which historical notices extend, and we find the Ætolians existing in a kind of democracy, at least during the time of their greatest political importance. This period extended from about B.C. 224, to their complete conquest by the Romans, B.C. 168, a period of about 50 years. The Ætolian league at one time comprehended the whole country of Ætolia, part of Acarnania and of South Thessaly, with the Cephallenian isles; and it had besides, close alliances with other places in the Peloponnesus, especially Elis, and even with towns on the Hellespont, and in Asia Minor. This alliance with Elis would tend to confirm the tradition of the early connexion already alluded to. Following, probably, the example of the Achæan league, the different parts of Ætolia formed a federal union, and annually chose a general or president, a master of the horse, a kind of special council called Apokletoi (the select), and a secretary, in the national congress held at Thermum about the autumnal equinox. Such scattered notices as we possess about their history and constitutional forms are found principally in the Greek writer Polybius, (books ii. iv. xvii., &c.) Though the Ætolian confederation, such as it was in its earlier times, was anterior to the Achæan union of Dyme, Patræ, &c., yet its more complete organization was most probably an imitation of the Achæan league. A minute account of this confederation, which, after all, would be little more than conjecture, is not within our plan. [See Schlosser, *Univ. Hist.* vol. ii. p. 1. Hermann, *Lehrbuch*, &c.]

AFFETTUO'SO, (Ital. *affectionate*) in music, signifies a tender, expressive style; and slowness is invariably implied. In regard to movement it may be considered as equal in degree to larghetto. See LARGHETTO.

AFFIDAVIT, in Law, is a statement of facts in writing, on oath. The word is the perfect tense of the barbarous Latin word *affido*, to pledge faith to, and is taken from the old Latin form of a declaration on oath, which commenced thus: '*Affidavit J. S.*,' 'J. S. hath sworn, &c.' By the law of England affidavits are necessary in a variety of cases, in order to bring facts under the cognizance of courts of justice all evidence of facts must be given on oath, either by oral testimony or by affidavit. Where evidence is to be acted upon by juries, it is given as oral testimony; where it is to inform a court or judge, it is usually reduced into the form of an affidavit.

In point of form, an affidavit is usually made as follows: if made in a cause, the name of the court in which the cause is pending, and the names of the plaintiff and defendant, are written at the head of the paper. The name, description, and residence of the deponent, or person making the affidavit, are written at length, and the individual making the affidavit signs his name at the foot of it. The paper is then shown to him, and he is requested to swear to his name and handwriting, and that the contents of the paper are true. And, lastly, the *jurat* (a term derived from the Latin word *juratum*, 'sworn') expressing the officer before whom, and where, and when, the affidavit is made, is signed by such officer. If the affidavit be sworn in open court, that circumstance is mentioned in the *jurat*, and no officer is named.

AFFINITY. Chemical affinity, sometimes called chemical attraction, is that power by which bodies combine and form compounds always possessing some properties very different from those of their constituents, and frequently diametrically opposite to them. It differs from the attraction of gravitation in not acting on masses, and only at sensible distances. In this last property it resembles cohesive affinity, but is distinguished from it by occurring only between the particles of dissimilar bodies. Thus, the particles of a mass of sulphur are held together by cohesive affinity, and so also are those of a mass of copper; but if a particle of sulphur be brought into contact with a particle of copper, the two particles being different, and possessing chemical affinity for each other, unite by this power, and form sulphuret of copper.

Chemical affinity, then, can be exerted only between the particles of dissimilar bodies; and when these are placed in contact, the proportions in which they combine are fixed and definite. It is, indeed, true, that there are some bodies, and especially fluids, which mix and appear to combine in all proportions. Thus, any quantities of water and alcohol (spirit of wine) may be mixed, and no separation afterwards ensues; yet though they thus *mix* in all proportions, it is probable that they *combine* chemically only in definite quantities. When common salt is added to water a certain portion of it is dissolved, dependent upon the affinity existing between the solid and the fluid.. The solution of salt is said to be saturated when the water refuses to dissolve more of it; but with water the solution will mix to any extent, for no repulsive power exists between them as between oil and water: we may, however, consider the water which is so added as merely in a state of mixture, and not of chemical combination.

Although none but dissimilar bodies unite by chemical affinity, mere dissimilarity will not of itself ensure combination: thus, water and mercury, water and oil, mercury and oil, though very different fluids, cannot be made to unite; and hence it is concluded that they have no chemical affinity for each other.

The simplest cases of chemical affinity are those in which two elementary bodies unite into a binary compound, as when iron combines with oxygen to form oxide of iron. This is the result of what is termed *single affinity*, and this power may be exerted between two elementary or two compound bodies; and also, though it occurs more rarely, between an elementary and a compound substance. For example, sulphur and copper, both elementary bodies, readily unite when heated: sulphuric acid and oxide of copper, both compounds, combine with great readiness; but no combination of sulphur and oxide of copper, or of sulphuric acid and copper, is at present known. There is then a greater disposition to combination between two elements or two compounds, than between an element and a compound· the rule is, however, by no means without exception, for cyanogen, a compound body, combines with mercury, an elementary one, to form cyanuret of mercury.

It has been mentioned that, when bodies combine by chemical affinity, they undergo great change of properties: it might, however, be supposed that a compound would possess qualities intermediate between those of its constituents. This, however, is by no means the case; nor, even though we may be well acquainted with the properties of the elements, can we at all tell, *à priori*, what kind of a compound they will form: sulphur is yellow, copper is red, but the sulphuret of copper, resulting from their union, is black. Again, sulphuric acid has great affinity for water, and, when diluted, turns vegetable blues red: potash has also great affinity for water, and renders vegetable blues green. The acid and potash are also both extremely acrid, and they have great affinity for each other; but combine them by *single affinity*, and a salt, called sulphate of potash, is produced, which has very slight affinity for water, does not act upon any vegetable colours, and, instead of being acrid to the taste, like both its constituents, is merely bitter and saline. In this case of chemical affinity an almost total reversal of properties has occurred; but there are cases in which it is far from being so complete, and in which one or both of the ingredients still exert some of their original powers: thus, the sulphate of potash, above alluded to, is capable of combining with an additional quantity of sulphuric acid. This salt, which is called bisulphate of potash, resembles both its constituents in having affinity for water, as is shown by crystallizing in combination with it, and by being readily soluble in it; and it resembles sulphuric acid in having a sour taste, and turning vegetable blues red.

We have stated a few examples of the changes produced in bodies by a combination effected by chemical affinity. The alterations, in many cases, are more striking and complete; the properties of the substance formed by the combination being altogether different from those of the bodies from which it has originated. Sulphuret of copper, as already noticed, differs in colour from both its elements, yet it resembles both in being solid; but there are numerous cases in which the form, colour, smell, taste, density, and other physical qualities, and the chemical properties of fusibility, volatility, solubility, and tendency to combination in the compound, bear no resemblance to its constituent parts.

Although, when speaking of the action which is induced by chemical affinity, chemists are frequently in the habit of stating merely that one substance has affinity for another, yet it is to be understood that the force with which bodies unite arises from mutual and equal affinity: thus, sulphuric acid and potash combine, not merely on account of the affinity of the acid for the alkali, but of the alkali equally for the acid Chemical affinity, then, is mutual and equal between those substances which combine by its power. Many different compounds may be formed by uniting one substance, an acid, for example, with various others, as with the alkalis, earths, and metallic oxides; these are called bases; and the force of affinity of any acid for any base differs in every instance. Now, this difference constitutes what has been termed *elective affinity*,—the existence of which is easily proved, and the results of its action are of the highest importance, both in a scientific point of view, and with regard to chemical agency as connected with the most common processes in the chemical arts and manufactures.

Nitric acid is capable of combining by *single affinity* with lime or with magnesia; and if some dilute nitric acid, containing 54 parts of real acid, be mixed with 28 parts of lime, the earth will be dissolved in the acid, and a neutral solution of nitrate of lime is obtained. A similar quantity of this acid forms a neutral solution of nitrate of magnesia by combining with 20 parts of that earth. Now, if we mix together 54 parts of nitric acid, 28 of lime, and 20 of magnesia, it might be supposed that the acid—which is of course incapable of dissolving the whole of both of the earths—would dissolve them in the proportions of 14 of lime and 10 of magnesia: it is found, however, that this is not the case, for the whole of the lime is dissolved and the magnesia entirely left.

It appears, then, a greater mutual affinity, or an *elective affinity*, exists between nitric acid and lime, than between nitric acid and magnesia. There is another mode in which elective affinity acts, and is employed in a vast number of chemical processes. It has been just stated that 54 parts of nitric acid combine with 20 of magnesia by single affinity. Now, if to the solution of nitrate of magnesia thus obtained we add 28 parts of lime, and boil the mixture, the lime separates the magnesia from the nitric acid; and being dissolved instead of it, we procure a solution of nitrate of lime, instead of nitrate of magnesia: this operation is termed *single decomposition*, and it is produced by single elective affinity. It is therefore evident, that this power may not only prevent one substance from combining with another when three are mixed, but supposing two to have been previously combined, it is capable of effecting a separation between them.

On the action of single elective affinity producing single decomposition, depends the process of preparing acetic acid from acetate of soda by means of sulphuric acid; and the production of ammoniacal gas by distilling a mixture of lime, sulphate of ammonia, and water.

To exhibit the degrees of elective affinity, tables were constructed by Geoffroy, a French chemist, about a century ago. In these the substance whose affinities are to be expressed is placed at the head of a column, and is separated from the rest by a horizontal line; beneath this line are arranged the bodies with which it is capable of uniting in the order of their respective forces of affinity; the substance which it attracts most strongly being placed nearest to it, and that for which it has the least affinity at the bottom of the column · thus, in the case of sulphuric acid, the affinities are exhibited in the following order:—

Sulphuric Acid.

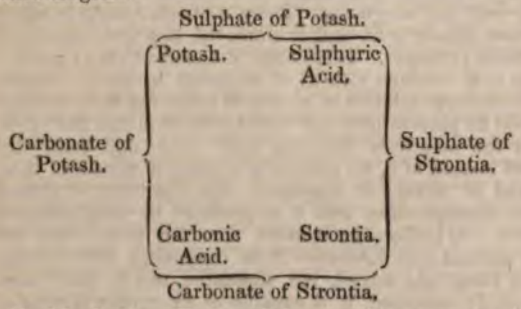
Barytes,
Strontia,
Potash,
Soda,
Lime,
Magnesia.

It would appear from this table, that barytes separates sulphuric acid from combination with all the substances placed below it, and that magnesia is separated from sulphuric acid by all that are above it. There are, however, many circumstances which interfere with the accuracy of tables thus constructed, and diminish their utility, since affinity is not an absolute force, but subject to anomalies and to modifications from various disturbing causes.

In the above, and many similar tables, the affinity of an acid for different bases is expressed; but on other occasions, the affinity of the same bases for different acids is required. In this case the alkali, earth, or metallic oxide, is placed at the head of the column, and the various acids are arranged according to their affinity for it.

There is yet another mode in which elective affinity is exerted. Certain compounds can scarcely be obtained at all, or with great difficulty, either by single affinity or single elective affinity, but are readily obtained by what is termed *double elective affinity*. There is a well-known mineral body called sulphate of strontia, which consists of sulphuric acid and the earthy base (or strictly speaking, metallic oxide) strontia, and they are combined by single affinity. Now potash has great affinity for the sulphuric acid of the sulphate of strontia; but if we mix them, no decomposition takes place, the potash being incapable, by single elective affinity, of detaching the sulphuric acid from the strontia. Again, carbonic acid and strontia have great affinity for each other, but if carbonic acid gas be passed through water in which powdered sulphate of strontia is diffused, it does not by single elective affinity separate the strontia from the sulphuric acid.

That decomposition, however, which single elective affinity cannot in this case perform, may be effected by double elective affinity, producing *double decomposition*. If, instead of acting upon the sulphate of strontia with the carbonic acid and potash separately, we combine them and boil the powdered sulphate of strontia in a solution of the carbonate of potash thus formed, double elective affinity ensues, and two new compounds are formed,—namely, sulphate of potash, which remains in solution, and carbonate of strontia, which, being insoluble in water, is precipitated in the state of a white powder. The double elective affinity which produces double decomposition will be illustrated by the annexed diagram.



Double elective affinity and decomposition are extensively employed in chemical operations; the preparation of various acids, such as the nitric and muriatic, and of a great number of saline compounds, depends upon the application of these modifications of chemical affinity. We shall now illustrate a position already stated, viz., that chemical affinity is not to be considered as an invariable power, but subject to causes which prevent, increase, or reverse its action; and it is on this account that tables of affinity express merely the order of decomposition, and not that of attraction under every circumstance. The causes now alluded to may be comprehended under *form* and *proportion*, and the modifying effects of heat, electricity, and light.

With respect to *form*, it may be observed, that the solid state is unfavourable to the exertion of chemical affinity; and it was once supposed that two solid bodies could not act chemically upon each other. That this is not the case may be proved by adding lime to muriate of ammonia, for by their mutual action ammoniacal gas is plentifully evolved. Division is, however, in all cases favourable to chemical affinity: thus, a mass of marble dissolves slowly in muriatic acid, but when reduced to powder the action is extremely rapid. In some cases mechanical division, however minute, is insufficient to allow combination: thus, if finely powdered pipe-clay be added to dilute sulphuric acid, no chemical affinity is exerted between them, the cohesive affinity of the particles of clay exceeding that of their chemical affinity for the sulphuric acid. If, however, we take a solution of alum and add ammonia to it, the clay is precipitated from it in so minutely divided a state that the acid immediately dissolves it.

When a jet of hydrogen gas is thrown upon a mass of platina, no effect whatever is produced, but when the platina is very minutely divided, then chemical affinity is excited; the platina becomes first red-hot, then inflames the hydrogen, and water is formed during its combustion.

Minute division, then, so as to reduce the cohesion of a body, is in many cases necessary to the exertion of chemical affinity, and in all cases it increases the rapidity of its action.

Fluidity is always favourable to chemical action, and in most cases it is requisite that one body, at least, should be in that form. Thus galls and sulphate of iron, though both are reduced to fine powder, do not act upon each other: dissolve either of them and add the other in powder to the solution, and chemical affinity will be exerted; but if they are both dissolved, then the action is instantaneous.

There are some instances in which affinity is but feebly, if at all exerted, unless both bodies be so finely divided as to be exposed to each other in the aëriform state: thus sulphur is capable of combining with alcohol. Little of it is, however, dissolved by the spirit when it is merely powdered; but if the sulphur and alcohol be heated in separate vessels, and their vapours be suffered to mix, they then unite.

The nascent state of bodies is one which is extremely favourable to the action of chemical affinity. Chlorine has affinity for silver, and the compound which they form, called chloride of silver, is white and insoluble in water; hydrogen has great affinity for chlorine, and they combine to form muriatic acid. If, however, hydrogen gas be passed into water holding chloride of silver in suspension, no change occurs, for the hydrogen has not, under these circumstances, the power of separating the chlorine from the silver.

If the hydrogen be evolved in the vessel which contains the suspended chloride of silver, it has then an opportunity of coming into contact with it in its *nascent state*, that is at the moment of its separation from combination, and before it has assumed the state of gas. Under these circumstances the hydrogen separates the chlorine from the silver, muriatic acid is formed, and metallic silver separated. It is, however, easy to combine chlorine and hydrogen gases by exposing a mixture of them either to the sun's rays, the taper, or the electric spark. But the gases which constitute ammonia, viz., hydrogen and azote, do not unite unless one of them, at least, is in the nascent state: thus if iron filings moistened with water are exposed to azotic gas confined over mercury, ammonia is produced, for the water is decomposed by the iron, its nascent hydrogen unites with the azote to form ammonia, and its oxygen with the iron to form the oxide of that metal.

The nature of the compounds, arising from the chemical affinity and action of their elements, is greatly influenced by the *proportion* of the substances employed to produce them. When equal weights of sulphuric acid and alcohol are subjected to distillation, the product is sulphuric æther; double the quantity of acid, and oil of wine is obtained; use ten parts of acid to one of alcohol, and olefiant gas is formed by their mutual action. Again: if a mixture of two parts of nitre and one part of sulphuric acid be distilled, there are produced nitric acid and sulphate of potash; but if a part of the sulphate of potash be dissolved in the nitric acid, nitrate of potash will be again formed, accompanied with bisulphate of potash.

There are several other cases which prove that the proportions of the substances which act chemically upon each other, greatly influence the nature and proportions of the new compounds formed: thus, when 100 parts of sulphate of barytes are boiled in a solution of 59 parts of carbonate of potash, 23 of the sulphate are decomposed and converted into 19·3 of carbonate. When also 85 parts of carbonate of barytes are boiled in a solution of 74 of sulphate of potash, decomposition also takes place, and there are formed 67 of sulphate of barytes, and 40 of carbonate of potash. In these experiments, then, it appears that decomposition cannot in either case be entirely effected, while the new compounds formed remain in mixture with the portions of the original salts which remain undecomposed. In other words, there takes place a partition of bases between the acids whose action is opposed to each other.

Heat, according to its degree and under various circumstances, produces very different effects on chemical affinity, and causes, increases, reverses, or prevents its action. If we mix oxygen and hydrogen gases, they will remain in a state of mixture for an indefinite period without combining; but if flame be applied to them they combine with explosion, and water is formed. Water dissolves certain salts, but to a limited extent only when cold; boil it and the solvent power is greatly increased. When mercury is moderately heated in atmospheric air it is converted into peroxide, by combining with the oxygen of the air: heat the compound thus formed more strongly than was required for its production, and the affinity is destroyed; oxygen gas is given out, and the mercury returns to its metallic state. Mix solutions of chloride of calcium and carbonate of ammonia; double decomposition ensues; carbonate of lime and muriate of ammonia result. Evaporate the mixture to dryness, and heat the residue; the order of affinities is reversed, and chloride of calcium and carbonate of ammonia are reproduced: in this case, heat reverses the order of affinities. There is one instance, however, in which heat produces effects that are quite anomalous and irreducible to any idea of their dependence upon degree of temperature; it is this:—when the vapour of boiling water is passed over ignited iron, the water is decomposed; hydrogen, one of its elements, is evolved in the state of gas; and oxygen, the other, combines with the iron and converts it into oxide. Now if we ignite this oxide of iron and pass hydrogen gas over it, the oxide is decomposed, its oxygen combines with the hydrogen, and water is re-formed. No satisfactory explanation of the laws of affinity, by which these opposing results are obtained, has hitherto been offered. These facts afford an illustration of the disturbing causes which very much limit the usefulness of tables of affinity. According to the first experiment, oxygen and iron combine in preference to oxygen and hydrogen, whereas it appears from the second that the affinity of oxygen for hydrogen exceeds that for iron. But it is evident that these statements are irreconcilable with each other; and as the temperature is in both cases the same, no variation of it can account for the incompatible results of the experiments.

Electricity possesses remarkable power over chemical affinity: if the electric spark be passed through a mixture of oxygen and hydrogen gases, it causes them to combine, and water is formed by their union. It is, however, probable that this and some similar effects are produced by the heat which accompanies the electrical spark; but there are other cases of combination which must perhaps be attributed to specific action, as, for example, when nitric acid is formed by the agency of electricity upon atmospheric air.

The action of electricity is much more remarkable in causing decomposition than combination, and especially that form of it which is termed voltaic electricity, or galvanism; the first substance decomposed by it was water. When two platina wires are connected with the poles of a voltaic trough, and their unconnected ends are immersed in water, hydrogen-gas is evolved at the negative, and oxygen-gas at the positive wire. Many other compound bodies have been similarly decomposed: their elements separate at the opposite poles, and the same body always appears at the same pole: thus in all decompositions, oxygen, chlorine, and the acids go over to the positive surface, while hydrogen, the metals, inflammable substances in general, and the alkalis, are found at the negative surface.

In common electrical attraction, the bodies attract each other in consequence of their opposite electrical states; and in the same manner, in the electro-chemical theory proposed by Sir H. Davy, it is supposed that acids and other substances which are attracted in electrical decompositions to the positive pole, are negatively electrical at the moment of their separation from combination; and on the contrary, the alkalis, which are found at the negative extremity, are positively electrical.

It has, however, by no means been proved that chemical affinity is identical with electrical attraction; and we must yet consider it as a peculiar species of attraction, subject indeed to the control of electrical agency, which is capable, not merely of decomposing compounds, but of suspending chemical action and reversing the order of affinities.

If sulphate of soda be dissolved in a blue vegetable infusion and subjected to voltaic electricity in a glass tube, it is soon found that the fluid at the positive pole becomes red, indicating the presence of an acid, while at the negative it is green, showing the action of an alkali. In this case the sulphate of soda is not only decomposed, but its constituents, while under electrical influence, appear to be incapable of recombining; for, by reversing the position of the tube, or the places of the wires, the fluid which was red will become green, and the green red: thus proving that, while under electrical influence, chemical affinity is suspended, for the acid and the alkali must have passed through the same solution without combining.

That affinity may be controlled by altering the electrical state of a body, is also proved by Sir H. Davy's very curious experiments on copper-sheathing, which, though they failed from unforeseen causes, are worthy of his genius. It appeared to Sir H. Davy that the copper was oxidized by the atmospheric air in the sea-water, and that then it took muriatic acid from muriate of magnesia and formed with it submuriate of copper, and hence ensued the destruction of the metal. Now, as metals combine with acids only when oxidized, it occurred to Sir H. Davy, that if he could render the copper negative, which is the electrical state of the oxygen, they would not combine. This he effected by bringing the copper into contact with zinc or iron; these being rendered positive, the copper became negative, scarcely combined at all with oxygen, and was so little acted upon by the muriate of magnesia in sea-water, that when protected by only 1-1000th part of iron, oxidizement and conversion into submuriate were, to a certain extent, prevented.

The following will also serve as an example of the reversal of chemical affinity by electricity. Immerse a piece of copper in a solution of nitrate of silver; the copper is dissolved and the silver precipitated: if we reverse the experiment, and put a piece of silver into a solution of nitrate of copper, no change is effected; if, however, the silver while immersed be touched by a piece of iron, a voltaic circuit is formed, the order of affinity is reversed, the copper is precipitated, and the silver is dissolved.

Light is capable of controlling chemical affinity both with respect to decomposition and combination. If a mixture of hydrogen and chlorine gases be exposed to the sun's rays, they combine with explosion, and form muriatic acid· this effect does not appear to be produced by the heat which accompanies the light, for a considerably higher temperature is not capable of producing the combination. With respect to the decomposing agency of light, it is well known that if pale nitric acid be subjected to it, it suffers decomposition to a certain extent, oxygen gas being evolved: it is also found that some metallic oxides which retain the oxygen with but slight force of affinity, evolve it and are reduced to the metallic state by the agency of light.

In concluding the subject of chemical affinity it is to be observed, that substances often combine in more than one proportion of each, and the quantities are governed by certain laws, which will be considered under Atomic Theory.

AFFINITY, in Law, means a relationship by marriage, The husband and wife being considered, in law, as one person, those who are related to the one by blood, are related to the other in the same degree by *affinity*. This relationship not being the effect of nature, but the result of civil institution, the persons between whom it exists are said to be related *in law*; the father or brother of a man's wife being called his *father* or *brother-in-law*. Almost the only point of view in which affinity is a subject of any importance in the English law is, as an impediment to matrimony;—persons related by affinity being forbidden to marry within the same degrees as persons related by blood. [See Marriage.] It is in consequence of this rule that a man is not permitted, by our law, after his wife's death to marry her sister, aunt, or niece,—those relations being all within the prohibited degrees of *consanguinity*; and therefore, according to the principle just laid down, the prohibition extends to the same relations by *affinity* also. This rule, which excludes from marriage relations by affinity within certain degrees, is founded upon the Levitical law; and doubts have been entertained by very learned writers, whether its introduction into the municipal laws of modern countries is necessary or useful. [See Michaelis, *Mosäisches Recht*. b. iii. c. 7.]

AFFIRMATION, in Law, is the solemn asseveration made by individuals belonging to the class of Dissenters called Quakers, in cases where an oath is required from others. This indulgence was first introduced by the statute 7 and 8 Wil. III., chap. 34, which enacts that the solemn affirmation of Quakers in courts of justice shall have the same effect as an oath taken in the usual form. The provisions of this statute are explained and extended by 8 Geo. I., chap. 6, and 22 Geo. II., chap. 46, sect. 36; but in all these statutes there is a clause expressly restraining Quakers from giving evidence on their affirmation in criminal cases. This absurd exception, which Lord Mansfield called 'a strong prejudice in the minds of the great men who introduced the original statute' (Cowper's *Reports*, p. 390), has been entirely removed by a recent enactment (9 Geo. IV., chap. 32): and Quakers and Moravians are now entitled to give evidence in all cases, criminal as well as civil, upon their solemn affirmation. A curious question arose during the present session of parliament (1833), respecting the sufficiency of the affirmation of a Quaker, instead of the customary oaths, on his taking his seat in the House of Commons; the subject was referred to a committee, upon whose report the House resolved that the affirmation was admissible.

AF'FIX, a term in Grammar, to which the name of *suffix* also is sometimes given. It signifies a *syllable* attached to the *end* of a word by which the form and signification of the word are altered. This will be best explained by some examples from our own language. Thus in the words *wealth-y*, *weight-y*, *bulk-y*, and in *god-ly*, *odd-ly*, &c., the syllables *y* and *ly* are the affixes, which qualify the meanings of the words to which they are attached, and fit them for a new and different use; as 'This man loves *wealth*;' 'That is a *wealthy* merchant.' Verbs are in this way made from adjectives, as from the adjectives *sharp*, *quick*, *thick*, we have *sharpen*, *quicken*, *thicken* respectively; and adjectives and adverbs from nouns, as in the examples just given. The *'s*, which marks our possessive case, is an affix, having originally been a distinct syllable, as we see from our old books in such expressions as *Goddes* will; *mannes* duty. Some persons are of opinion that this *'s* has arisen from the possessive pronoun *his*, as in such a phrase *God his will*, *man his duty;* but we are of opinion that this final *'s* is to be referred to the German and Anglo-Saxon genitive termination *es*. When we hear people vulgarly say *hisn*, *hern*, for *his*, *her*, the *n* is the remnant of the syllable *en*, which in these instances marks a kind of pronominal adjective, akin to the genitive or possessive case;—as we may still observe in the German forms *dessen*, &c.

In the Latin and Greek, and many other languages, there is the same system of affixes of which we have given examples in the words *weighty*, *bulky;* and in these languages the different cases of nouns, and adjectives, and the different tenses and persons of the verbs, are also formed by affixes. Thus the nominatives *Pindaru-s*, *Homeru-s*, *Liviu-s*, *Antoniu-s*, are the true Roman forms of these names, which, in the accusative, form *Pindaru-m*, *Homeru-m*, &c., respectively, and so on in the other cases. With the English, it is the common practice to shorten all these words to Pindar, Homer, Livy, Antony; and yet we are not consistent in this practice, for we say *Tibullus*, *Æmilius*, &c. keeping in these instances the genuine form just as it is in the language to which these names belong. The irregularity depends upon the greater or less familiarity of the names. With the French, the changes are still more violent.

AF'GHANISTAN is a country of Asia, extending from the Indus on the east to Persia on the west, and from the great chain of Hindoocoosh on the north towards the Indian ocean on the south. Taken in its largest acceptation, and including the nominally dependent provinces of Balkh (the ancient Bactria), Cashmere, Herat, Beloochistan, &c., the limits of the empire are the 24th and 37th degrees of north latitude, and 62° and 77° east longitude. This great territory includes a varied population of above fourteen millions, consisting chiefly of Afghans, Persians, and Indians.

The name is Persian, and, though not unknown to the Afghans, is not used by them. They have, in fact, no name for their country: they call themselves Pushtaneh.

An enormous table-land of high elevation extends from the coast of Korea to the Black Sea, varying considerably in its breadth from north to south between these two limits. It consists of two portions, of which the eastern is the higher This elevated table-land has also its elevations, or mountains; of which the Himalaya range forms the great southern boundary, the western part of which is called the Hindoo Koosh. The higher ridges of the Hindoo Koosh are bare rock, perfectly free from verdure, and in many parts covered with perpetual snow. The gentlemen of the British embassy, in June, 1809, saw no diminution of snow on this ridge, though at Peshawer, within fifty miles, the thermometer stood at 113°. It is much intersected with narrow but fertile valleys, and is finely wooded near its base. Its general height is very great, and some of its peaks are supposed to be higher than those of the principal ridge, which runs about 200 miles farther north, and is there called the Mooz Tagh, or Ice mountain. It enters Afghanistan to the north of Cashmere, crossing the Indus, which rises in the principal ridge to the N.E., and proceeds chiefly with a western direction to the high peak of Hindoo Koosh, N.W. of Cabul (long. 68°, lat. 35°), where it loses its name and character. About 71° long. the *range* sinks suddenly to receive the river Kama, which rises in the chief ridge. With this exception, all the streams which join the Cabul on the north have their sources in the Hindoo Koosh. From long. 68° a range of mountains of a lower character extends 350 miles to the west, reaching nearly 200 miles from north to south. These mountains are called by European geographers the Paropamisan mountains; they are generally cold and barren, difficult of access, and very little known. Their northern face is a rapid descent into Balkh, part of the ancient Bactria.

Another chain, inferior in height to the first mentioned, extends from the Cabul river, immediately opposite the great chain, to the 29th degree of latitude. This range is called the mountain of Soliman; it runs parallel to, and near the Indus, to which river it has a very steep descent. It is traversed by the river Gomul, whose sources are far to the west, and its continuity is doubtful in other parts. Except its northern extremity, where snow is found throughout the year, no part of the Soliman range has snow beyond the spring.

Beyond these our accounts of the mountain courses of Afghanistan are founded chiefly on conjecture. Several branches appear to extend westward from the Soliman, and they are said to join the Paropamisan; but their ranges are unknown. The southern country appears full of mountains, which reach from the south of the Soliman in parallel ridges westward to the table-land of Kelat in Beloochistan.

The whole of Afghanistan, extending south from the great ridge, is a lofty table-land, considerably elevated above the neighbouring countries. Its northern boundary looks down on the low land of Balkh or Bactria, and its eastern limit on the valley of the Indus: towards the west it slopes gradually to the desert, and on the south sinks rapidly to Beloochistan and the Indian ocean.

The rivers of Afghanistan, though of considerable length, are not large, and are all fordable during the greatest part of the year. Although many give great promise on issuing from the hills, so much of their water is drawn off for the purposes of irrigation, and so much exhausted by evaporation, that, excepting in the rainy season, scarcely one reaches the end of its channel. The Cabul, the chief of the rivers flowing eastward, is formed by various streams uniting to the east of Cabul, the capital; the rivulet which gives its name in our maps to the whole river, rises twenty-five miles west of Cabul, about 34° N. lat., 69° E. long. It is joined a little below the city by a much larger stream from the west of Ghizni; and farther east, at 70° E. long., by the united streams of Ghorebund and Punjsheer, from the mountains of Hindoocoosh. At Kama (71° E. long.), near Jellalabad, it receives the great river of Cashgar, called in our maps Kama, which issues from the Pooshtikhur, in the Beloor Tagh, near the source of the Oxus, 38° N. lat., 73° E. long. This is the most important of all the branches of the Cabul, the united stream falls into the Indus about three miles above Attock, in 34° N. lat., and 72° 20′ E. long. The names here given are those of our maps; in fact, there appears to be no general name for any river of Afghanistan; every branch has its separate appellation, and the same stream rarely retains the same name above fifty miles of its course.

The principal river of those that run westward is the Helmund, (the Etymandrus or Hermundrus of the ancient geographers,) which rises in the same range that contains the sources of the Cabul. After running about two hundred miles through mountains, the Helmund continues its course across the western desert, until it reaches the great lake of Sejestan, commonly called Zerrah.

The Helmund overflows every year like the Nile, and, like that river, spreads fertility over its banks; for though the lower part of its course is through a perfect desert, the immediate shores of the river form a fertile, populous, and well-cultivated country, called Gurmzeer.

The climate is very variable, and a region hot as India may be found within a day's journey of a perpetually frozen country. The east is generally much hotter than the west, and in the plains of Peshawer a thermometer in the shade rises to the height of 128° in July. In the same place, frost lasts to the beginning of March. The spring is very rapid; before the end of March, plum-trees and apple-trees are in full foliage; barley is in the ear; the heat is already disagreeable, and in May the very wind is hot. In the hot parts of the country, the simoom is felt occasionally: this is a hot wind, which lasts but a few minutes, but its effects are terrible; a person exposed to its full influence drops senseless, and rarely recovers its approach is known by a peculiar smell, on perceiving which, every living being runs to seek shelter. It is conjectured that the hydrophobia, which attacks dogs, wolves, and jackals, is caused by the simoom.

The season of rains, called in India the south-west monsoon, is felt in the eastern parts of Afghanistan, though not so violently as in India. It commences about the end of July, when the earth, which has been parched by the summer heat, resumes the appearance of spring with miraculous rapidity; at other times there is little rain, fogs and clouds are rare, and the air is usually dry. The average heat is less than in India; and the difference of temperature between day and night, and winter and summer, is much greater than either in India or England. The climate generally is healthy; the most common diseases are fevers, colds, and ophthalmia; and occasionally the small-pox is very fatal, in spite of inoculation, which has been long practised.

The mineral resources of Afghanistan are not much developed. No gold is found, with the exception of some grains in the torrents near the great northern mountains, and but little silver; mines of lead and iron are wrought, and fine rock salt is dug in the north-west. Whole cliffs of lapis lazuli exist in the mountains.

The western country is mostly high and bleak, much fitter for pasturage than agriculture, and is generally inhabited by shepherds who dwell in tents.

The animals of Afghanistan are like those of India; the lion is small and very rare. Tigers and leopards are found in the eastern parts, and hyænas, jackals, wolves, and foxes, everywhere. There are many bears, but they rarely descend into the plains. Horses are common, and in some parts very fine. Asses are much used in the labours of agriculture; but the chief beast of burden is the camel, the same long-legged animal used in India. The stout short camel, with two humps, is sometimes used, but more rarely. The principal stock of the rural population consists of sheep; a fine handsome animal, with tails of solid fat a foot broad. Goats, dogs, and cats, with long silky hair, are all in abundance.

Two or three sorts of eagles frequent the mountains, and several species of falcons, many of which are used in hawking, to which the Afghans are much addicted; their game is chiefly the same as in Europe: wild ducks, swans, quails, partridges, &c. &c.

The trees are generally the same as in Europe, and our finest fruits grow wild in the plains and valleys. The products of agriculture are wheat, barley, rice, Indian corn, millet, pulse, tobacco, &c., &c., carrots, turnips, cabbages, and garden vegetables in general. In the eastern parts, dates, ginger, turmeric, cotton, and sugar-cane, are cultivated in favourable situations.

In a government so unsettled as that of Afghanistan, the political divisions are necessarily variable. When the British embassy was at Peshawer, in 1809, the kingdom was divided into twenty-seven provinces or governments, the eighteen most important of which were superintended by resident hakims, who collected the revenue and commanded the troops. Many of these provinces, as Sind, Mooltan, Cashmere, &c. &c., are now quite independent; others, as Balkh, Herat, Seestan, &c., though nominally connected with the government, do not come within our object, which is only to describe Afghanistan, and not its dependencies. On crossing the Indus at Attock, the first province is Peshawer, in the valley of the Cabul river; the provinces of Jellalabad, Lughmaun, and Cabul, follow in regular succession westward along the same river, and at its sources is the united province of Bamian and Ghorebund. All these provinces lie immediately south of the great chain of the Hindoo Koosh, and though small, they are the most important of the kingdom, by their fertility and population. South of Cabul is Ghizni; Candahar lies considerably to the southwest of Ghizni; and Furrah much farther to the west, within the country of Khorassan. In all these the chief town has the same name with the province.

The remaining nine divisions are composed of countries almost wholly inhabited by Afghans, or pastoral tribes, where there are few towns. There is a governor appointed to each, whose authority is little more than nominal, as he never resides, but generally leaves the government wholly to the heads of tribes, subject, perhaps, to occasional control. These nine provinces comprise almost the whole surface of the kingdom; the others, though politically most important, being only small populous districts, chiefly inhabited by people of foreign origin, and intersecting the nine large divisions. The most important of these divisions are the tribes of Damaun, inhabiting the countries between the right bank of the Indus and the Soliman mountains; the Ghiljies, stretching over the centre of the country, from the neighbourhood of Candahar to the mountains of the north, and inclosing the provinces of Ghizni, Cabul, Lughmaun, and Jellalabad; the Eimauks form a province in the west of the Paropamisan mountains; and the eastern part of the same range is the province of the Hazaurehs. The remaining include all the Afghan tribes subject to the government of the king.

The capital is Cabul, the chief city of the province of the same name, which forms the eastern half of Afghanistan. Cabul is situate on the Cabul, in a large well-watered plain, filled with villages. The town is surrounded on three sides by low hills, on one of which, to the north, is the king's palace. The tomb of the Emperor Baber, on a hill near the city, surrounded by large beds of flowers, commands a noble prospect. The town is not large, but is handsome and compact; and the houses are mostly built of wood, to avoid the consequences of the frequent earthquakes. Beautiful gardens surround the town, which is celebrated for its fine climate, though the proximity of the mountains causes great varieties of temperature. N. lat. 31° 10′, E. long. 71° 43.′

Peshawer is situated in a plain nearly circular, about thirty-five miles in diameter, and surrounded by mountains on every side, except a slip of fifteen miles width to the east. The plain is well watered and always green; it is in high cultivation, and produces plums, peaches, apples, pears, pomegranates, and mulberries, with a few dates. The city is about five miles round, and contains 100,000 inhabitants. The houses are built of brick, about three stories high: the streets are narrow and slippery, but are paved, and have a gutter in the centre. Part of the town is flooded during the spring rains, which make it then an unwholesome residence.

Ghizni was once the capital of an empire reaching from the Tigris to the Ganges, and was adorned with the most splendid buildings in Asia; but it is now reduced to about 1500 mean dwellings. Some remains of its ancient grandeur are still to be seen in its neighbourhood; among the rest the tomb of Sultan Mahmood, the conqueror of India. This structure is about three miles from the city, and is spacious, though not magnificent, and covered with a cupola. The doors, which are very large, are of sandal-wood, and said to have been brought as a trophy from the temple of Somnaut in Guzerat. On a tombstone of white marble lies the mace of Mahmood, of such a weight that few men can wield it. Mohammedan priests are still maintained, who constantly read the Koran over the grave. Ghizni is in 30° 11′ N. lat. and 68° 57′ E. long.

Candahar is on the site of an ancient city, conjectured to have been one of those founded by Alexander the Great. The present city is quite modern, and was founded by Ahmed Shah in 1754. That king made it the capital of his dominions; but on the accession of Timour Shah in 1774, the seat of government was removed to Cabul. Candahar is large and populous, supposed to contain 100,000 inhabitants. Its form is oblong, and its plan perfectly regular; four streets meet in the centre, in a circular place, fifty yards in diameter, surmounted by a dome. This is called the Chaursoo (sharshee), and is a public-market place, surrounded by shops; the four principal streets are fifty yards in width, are lined with shops, and extend to the gates of the city. The smaller streets are narrow, but straight, and all cross at right angles. The town is well watered by canals from the Urghundaub, a tributary of the Helmund; and a small stream runs through almost every street. The tomb of Ahmed Shah, covered by a gilt cupola, stands near the king's palace, and is held as a sacred asylum, the king himself not daring to take a criminal from it. Candahar, unlike any other city, is chiefly inhabited by Afghans, who have conformed externally to the habits of Persians. Its situation is in 32° 10′ N. lat., 66° 30′ E. long.

All the large towns are inhabited chiefly by Persians and Indians; an Afghan never keeps a shop or exercises any trade. The only Afghans found in towns are the officers of government and their followers, soldiers, priests and, perhaps, a few labourers. The houses of the rich are inclosed by high walls, and contain three or four courts, with gardens and fountains. Each court contains a building, with several small apartments, and three or four large halls, reaching to the roof, supported by wooden pillars, carved and painted, The apartments open on the halls, and are fitted up with paintings and looking-glasses. One room at least has glazed windows, and several have fire-places. The doors are carved, and covered in winter with velvet or brocade. The floors are covered with handsome carpets, and thick felt seats go all round the room, close to the wall, covered with silk or velvét. The houses of the common people are of one story, and usually of a single room, about twenty feet long by twelve broad: they have little ornament and scarcely any furniture. Neither tables nor chairs are used; their place is supplied by coarse woollen carpets and thick felt cushions.

The Afghans, who compose little more than a third of the dwellers in Afghanistan, are of moderate stature, but remarkably hardy and athletic. Their high cheek bones and prominent noses distinguish them essentially from the Tartars, with whom some persons have confounded them. Their complexions are various; men as fair as Europeans being found in the same places with others dark as Indians. The western tribes are fairer than those of the east. Their hair and beard are mostly black; occasionally brown or red. The usual dress is a sort of frock, reaching below the knee, and loose dark cotton trowsers. The head is covered with a low flat-sided cap of black silk, with a coloured or brocaded top. They wear half boots, laced in front. The dress of the western tribes resembles that of Persia, and the people of the east imitate their neighbours of India.

The manners of the Afghans are frank and open; they pay little respect to rank, but show great reverence for old age. They are very sociable, and give frequent dinner parties, which are accompanied by singing, dancing, and music. Any game of chance or skill, however childish, that may lead to a dinner, is played with great zest; marbles, prison-bars, hunt-the-slipper, hopping, &c. &c. and the loser treats his opponent. They are also fond of sitting in a circle, conversing, or listening to story-tellers. The people of the east notice the attachment of the Afghans to truth, in which they are much superior to their neighbours of India and Persia, though Europeans will not rank them very high in that respect. They are filled with family pride, and fond of recounting long genealogies, scarcely allowing a man to be a genuine Afghan who cannot prove six descents. They are very jealous of attentions paid to others, and can be more easily wrought upon by kindness than threats.

Hospitality is the great characteristic of Afghans; it is with them a point of honour; and a greater affront cannot be given to an Afghan than by inviting his guest to another dwelling. A man may travel without money from one end of the country to the other, and the bitterest enemy is safe if he claim the protection of hospitality. A person who has a favour to ask of any person goes to his house, and refuses to sit down or partake of food until the boon be granted. This custom is called *nannawatee*, and it brings disgrace on a man to reject a petition under such circumstances.

Another resemblance to the Arabs of the desert, so celebrated for their hospitality, is the practice of robbery by the ruder tribes of Afghans. A traveller passing through certain districts must expect to be plundered, if not under strong protection, while a stranger coming to settle amidst them is perfectly safe. These robberies, however, are never accompanied by murder, and where the government is powerful the traveller is safe.

The good qualities of the Afghans have been summed up, by stating that they are faithful, hospitable, brave, frugal, laborious, and prudent. Their bad qualities are revenge, avarice, envy, rapacity, and obstinacy.

Among the western tribes, the pastoral character is much retained; many tribes live entirely in black coarse woollen tents, and migrate with their flocks from place to place, as convenience directs. But although the larger extent of ground is occupied by the dwellers in tents, the dwellers in houses are the more numerous body. Agriculture is very generally on the increase: many parts of Afghanistan are highly cultivated, and the most remote regions are not without marks of human industry.

The religion of the Afghans is the Mohammedan of the Sunite sect, though accompanied with less bigotry than usual. Hindoos and Christians live peaceably and respected among them: and even Persians, who are of the dissenting Shiite sect, and, therefore, more abominated by the orthodox than even infidels, hold high official stations among them, upon the simple condition of abstaining from curses on the three first caliphs, the denial of whose right to the commandership over the Faithful forms the chief reason of their dissent.

Social intercourse with women is less restrained than among other Mohammedans, though in towns the females of the upper ranks live secluded, and never go out without a covering from head to foot. In the country, women go out unveiled. in the lower ranks, they do the work of the house, and in some of the inferior tribes assist the men in the labours of agriculture. Their marriage ceremonies are like those of the Persians.

The language of the Afghans is called Pushtoo; half the words of the language are Persian, but almost all the particles and verbs are from some unknown root. Many words have been said to be identical with those of the Zend and Pehlevi, the ancient languages of Persia, and with those of the Sanscrit, the ancient language of India; and this in cases where the words are quite obsolete in the modern dialects of these countries. This, however, is doubted by some. The structure of the Pushtoo refutes the old opinion that the Afghans are descended from the Jews. The sound of the language is rough, but not disagreeable to persons accustomed to oriental tongues. They use the Arabic alphabet, with points over and under certain letters to represent sounds unknown to Arabic. The only original Pushtoo authors are poets; their compositions are chiefly lyrics, of a spirited and bold cast, breathing a strong attachment to liberty. No Pushtoo authors are above a century and a half old; but Persian works are as familiar to the educated Afghans as their own, and the Persian language is that chiefly used in composition.

The education of the Afghans is not neglected; every village has its school, generally kept by a priest, and almost every boy attends it. In some tribes, boys are sent to a distant village, where they live in the mosque, and are under the sole guidance of their schoolmaster. The most celebrated university is at Peshawer.

Many females are acquainted with Persian literature, and almost all those of a certain rank can read; but writing is not commonly taught there.

The whole nation is divided into tribes, which continue much unmixed, each under its own peculiar government, with little interference from the royal power. The internal government of the tribes is republican; they are divided into separate clans, and each clan has its chief or khan, chosen from the oldest family. The khans administer justice in most cases, but rarely without the concurrence of a council of the heads of families. The clans are eminently exclusive, and are often at feud with each other. They appear to be little attached to their chiefs, but very strongly to their tribe. They are very jealous of interference, and their republican spirit has preserved the country from degenerating into the ordinary oriental despotism. The reply made to an English traveller, who expatiated on the freedom from alarm, blood, and discord, which must ensue from a more steady government, was 'We are content with discord, we are content with alarms, we are content with blood, but we will never be content with a master.'

The land is cultivated by tenants, who pay rent, or by persons who give half the produce to the landlord, receiving seed and instruments of agriculture from him. Many small proprietors cultivate their own land by the aid of hired labourers, or slaves attached to the soil.

The trade of Afghanistan is small, and only carried on by caravans. The most important trade is with India, whence they import cottons, muslins, ivory, indigo, tin, wax, sugar, and spices. The exports are horses, furs, shawls, tobacco, and fruits.

The government is a limited monarchy, The king may make peace and war; he has the control of the revenue, and appoints to such official situations as are not hereditary. He cannot increase the revenue, which arises from a fixed assessment on lands, and amounts to about 2,000,000*l.* sterling. He is, in fact, the Khan of the Duranees, the principal tribe; and although his power has infringed upon the republican institutions of his own clan, his right over other tribes extends only to the levying troops, and the collection of revenue. Over those of his subjects who are not Afghans, his power is less limited, but it is rarely exercised with severity. The Duranee lords control the king, who can rarely act without their concurrence. The crown is hereditary in the family, but elective as to the person.

The administration of justice is corrupt, as in every other Asiatic government. A cadi is appointed to every large town, before whom causes are brought, and whose awards are rarely disobeyed: death is very rarely inflicted, and the horrid mutilations so common in Persia are unknown. The cadi never interferes unless called upon; most cases are decided by the heads of tribes, as the Afghans dislike all application to law; and even a murder, if in retaliation, is rarely inquired into. The police generally is defective; watchmen are appointed in all large towns, paid by the inhabitants of the different wards. Parties are stationed in dangerous places for the protection of travellers, who find, however, the purchase of security from the clans a more efficient guard.

The military may be about thirty thousand. One-third of these are Gholams, or military adventurers, who enlist for life; about ten thousand are furnished by land-owners at a stated rate; and a large contingent is supplied by the Duranee clan, as the condition on which they hold their lands. Their soldiers are chiefly horsemen, and their arms are swords and matchlocks.

The history of the Afghans cannot be traced to a remote period. In the ninth century they were possessed of the north-eastern part of their present empire, and at the close of the tenth a chief of Khorassan conquered the country, and made Ghizni his metropolis. For two hundred years his family governed the empire; but although the plains were conquered, the Afghans maintained their independence in the mountains. At last, under the conduct of Mohammed of Ghore, a descendant of their ancient princes, they dethroned the king of Ghizni, and burned his capital, A.D. 1159. The new dynasty extended the empire from the Tigris to the Ganges; but while making conquests abroad, their own territories became the prey of a stranger; and while Afghans were seated on the throne of India, Jenghis Khan and his descendants ruled in Afghanistan. The Mongol dynasty reigned over the plains, and the Afghans dwelt in the mountains. After the death of Tamerlane, in 1405, the country appears to have been independent for a century. In 1506, the Emperor Baber, a descendant of Tamerlane, conquered Cabul, and made it the seat of empire: the plains of Afghanistan were then divided between India and Persia, but the Afghans still preserved their precarious independence. At the death of Aurungzeb, in 1707, when the Mogul empire lost its power, the Afghan tribe of Ghiljie grew strong, conquered Persia, and founded an empire of vast extent, but little duration. This dynasty was overthrown by Nadir Shah of Persia, who conquered the Afghans, and annexed their country to his empire. At his death in 1747, Ahmed Shah, an officer of an Afghan troop, in the service of Persia, fought his way back to his own country, and founded the present monarchy. From that time to the death of Timour Shah in 1793, the empire maintained its splendour, but on that event, a civil war broke out between the sons of the deceased king. Four brothers in succession gained the throne, the Persians invaded Khorassan, and several dependent rulers threw off their allegiance. The monarchy is still in the same unsettled state, and is, in fact, little more than a name; but the peculiar organization of the tribes obviates the evils which elsewhere result from civil war. The people take but little part in it, considering it merely a quarrel of kings, to whom they have not much attachment, and content themselves with defending their mountains, where they are rarely molested: and although the cities and great roads occasionally suffer from the disputes of contending factions, and the plunder of marauding armies, the country has lost few of its resources, and none of its enjoyments.

The chief authority for Afghanistan is Elphinstone's *Cabul*. The reader may also consult Foster, Rennell, and the Asiatic Researches: for the sixteenth century, see the *Ayin-i Akbari* of Abul Fazl. See also Hamilton's *History of the Rohilla Afghans*, in the country EAST of the Ganges, London, 1787; and Bernhard Dorn's *History of the Afghans*, part i., London, 1829.

AFIOUM, or OFIUM KARA HISSAR, (that is, the Black Castle of Opium,) is, according to D'Anville, situated on the spot where formerly Apameia Kibotos stood. At Afioum are remains of temples and palaces decorated with black marble. The site of Afioum is fixed in 38° 45′ N. lat. 30° 46′ E. long.

The original name of Apameia was Celænæ, under which denomination it is described by Xenophon, Herodotus, and Arrian. Antiochus Soter gave it the name of Apameia, as Strabo informs us, who also describes the place. Notwithstanding all this, it is not *yet* certain whether Afioum Kara Hissar, or some other town, represents Apameia; and this fact, when we consider the minuteness of the ancient descriptions, is one among other proofs how little we know of the interior of Asia Minor. Taking into account that Apameia was the centre of a great commerce, as Kara Hissar now is, and combining this with the resemblance of name and Pococke's description of the citadel, as compared with Arrian's account of Celænæ, it seems most probable that Afioum is Apameia. [But see Rennell's *Geography of Western Asia*, ii. p. 144.]

The following extract is taken from Pococke's *Travels*, whose opinion as to the ancient site differs from ours: 'Carahissar is distinguished among the Turks by the name of Aphioum Carahissar, on account of the great quantities of *ophioum*, or opium, which is made here. I had great satisfaction in finding, by an inscription, that Carahissar is the ancient Prynesia of Ptolemy, because it is of great use in making conjectures as to the situation of other places mentioned by that author. It is situated at the foot of the mountains round a very high rock, about half a mile in circumference, on the top of which they have built a fortress. The work is a sort of bastard, brown granite; it is of a black hue, from which the town is called Carahissar (the Black Castle); it is so very steep that it would be impregnable if supplied with provisions and water, and it seems to be half a quarter of a mile in perpendicular height. The town is near three miles in circumference, and it is a great thoroughfare, has much trade, and good shops provided with all sorts of things, being in a plentiful country, and many caravans pass through it. It is the residence of a pasha. There are in the city ten mosques; one of them is a noble building with a portico before it, the whole being covered with domes. There are neither Greeks nor Jews in the city, but about fifty Armenian families, besides several merchants and tradesmen, who stay here part of the year as they do in other towns, living in khans; they have two churches, and of late they have had a bishop, whom they call metropolitan. In the country between this and Smyrna they make most of the Turkey carpets,' &c.

The population of this town is stated at 50,000 or 60,000. It is of some importance for its fabrics of wool, tapestry, fire-arms, and sabres. But the chief article of commerce is the opium cultivated in the neighbourhood. Afioum is also the rendezvous of the caravans from Constantinople and Smyrna, which from this place proceed further into the interior.

AFRICA. In treating of one of the great divisions of our globe, it is necessary to say a few words on the plan which we have adopted as most suitable to a work of this kind. If we were to attempt a complete geographical description of Africa, it would have little value from being compressed within such narrow limits as we should be compelled to assign to it. Twenty numbers in succession would not be sufficient to enable us to give a satisfactory view of this continent, if we were to enter into details. We have, therefore, determined to present our readers with such a sketch or outline, as will show *generally* the present state of our knowledge with respect to Africa; and by turning to the separate articles, such as Alexandria, Cape of Good Hope, Egypt, &c., they will find under each head of city or country, the latest and best information that we have been able to collect. The following are the heads that we propose briefly to treat here:—

I. Africa as known to the Greeks and Romans.
II. Circumnavigation by the Portuguese, and their settlements. French and English discovery.
III. Short notice of what coasts have been surveyed.
IV. General remarks on the figure of Africa, its surface, mountain chains, plateaus, rivers, mineral productions, &c.
V. Varieties of the human race in Africa.
VI. Zoology of Africa.
VII. Botany of ditto.
VIII. Chief divisions, and foreign settlements.

I. The name *Africa*, which is no doubt of native origin, was probably first introduced into Europe by the Romans, who gave this appellation to one of their African provinces, which comprehended the city of Carthage. Africa was, therefore, properly the name of a limited district, which has since been extended to the whole of this vast continent: the same thing has constantly taken place in modern times, and the name of a remote spot or tribe has been magnified into that of a country or a nation. But the real name for this continent, both in the Greek and Roman writers, is Libya. Herodotus, the earliest extant Greek author who has transmitted to us any information about Africa, has given a proof of his limited acquaintance with it by the very simple division which he makes of its inhabitants. All the native tribes in the northern part he calls by the general name of Libyans, and those in the south Ethiopians. Egypt, according to his system, hardly belongs to Africa, but lies like an isolated slip between the two adjacent continents. He was evidently puzzled about assigning a boundary to Asia and Africa, and he is often led, almost unintentionally, though with perfect correctness, to give the name of Arabia to the part immediately *east* of the Delta and the Nile. Herodotus asserts that Africa is surrounded with water, except at the narrow neck now called the Isthmus of Suez; and one reason for his belief was apparently the story of Africa being circumnavigated by the Phœnicians in the reign of Pharaoh Necho, (as he is called in Kings ii. chap. 23,) King of Egypt, and between the years B.C. 610 and 594. The circumstances of the voyage as reported by Herodotus are very meagre, and when faithfully presented will enable the reader to form his own opinion of the probability of the voyage having been made. Nechos, King of Egypt, (Herod. iv. 42,) despatched some Phœnicians in vessels, with instructions to sail round Libya and through the pillars of Hercules (straits of Gibraltar) into the northern (Mediterranean) sea, and so to return to Egypt. The Phœnicians set out from the Red Sea, and navigated the southern ocean. When the autumn came on, it was their practice to land on whatever part of the coast they happened to be, to sow the ground and wait for the harvest. After reaping it, they would again put to sea; and thus after two years had elapsed, in the third they passed through the pillars of Hercules and arrived at Egypt. And they said, but for my part I do not believe the assertion, though others may, that in their voyage round Libya they had the sun on their right hand.'

This Phœnician voyage is the only direct statement as to the ancient *circumnavigation* of Africa that deserves a particular examination, and the best critics are divided in opinion upon it. We do not believe the circumnavigation was effected, and for the following reasons. Herodotus visited Egypt about 150 years after the event, a time long enough to allow the original story (for we believe the whole to be founded on *some* facts) to have become much perverted from the truth. The phænomenon of the sun being to the right hand, or to the *north* of the voyagers, would be observed during part of the year, if they never went beyond the straits of Bab el Mandeb. The time allowed for the circumnavigation is too short; and the difficulty of sowing and reaping on an unknown coast, to say nothing of the opposition which the natives might offer, and the dangers of the voyage itself, are serious objections: and, finally, the notion which Herodotus had, and which was long the prevailing one, that Africa did not extend so far south as the real equator, is decisive against the truth of the voyage. If it ever had been made, it is impossible that so erroneous a notion as to the southern extent of Africa would not have been corrected. We refer the reader to Mannert's *Geography of the Greeks and Romans*, vol. i., for further examination of this question, and other supposed circumnavigations. Compare also Gosselin, *Géographie des Grecs Analysée*, p. 108, &c.

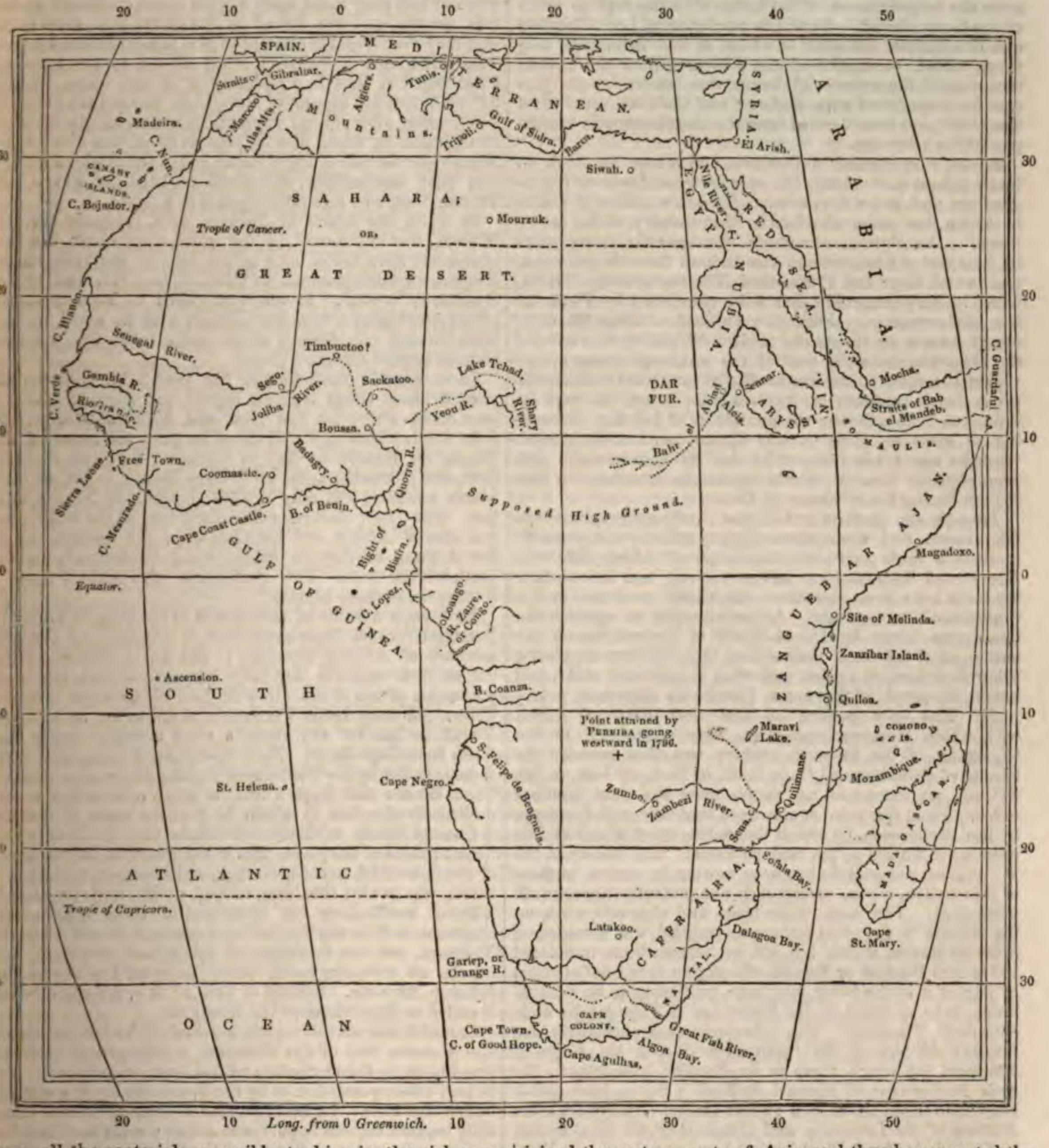
Another ancient voyage is somewhat better authenticated. Hanno, one of the ruling men of Carthage, or king, as he is termed, sailed from that city through the straits of Gibraltar, to establish some colonies along the Atlantic coast of the present empire of Marocco. He took with him a large fleet, and 30,000 settlers, whom he left at various places, and then bent his course further south. He passed a river with crocodiles and river-horses in it, and it has, therefore, been concluded that he went at least beyond the Senegal; but it is not easy to fix with any precision the extent of the voyage, though it must have been considerably to the south of the Senegal, according to the statement of the voyager. Yet it could hardly be farther than the Sierra Leone coast, and it *may* have extended not so far. Major Rennell, whose opinion is entitled to the greatest respect, gives this extent to the voyage; but he also advocates the truth of the Phœnician circumnavigation of Africa, which makes us somewhat more scrupulous than we otherwise should be in receiving his interpretation of the voyage of Hanno. M. Gosselin, who is more sceptical than the English geographer, does not carry Hanno further than the latitude of the Canaries. Polybius, the Greek historian, was sent by Scipio Æmilianus to explore the same coast, (*Pliny*, v. 1.) but it is impossible to state how far he went, from so defective an extract as that contained in Pliny. The time at which this voyage of Hanno was made is uncertain, though we are inclined to place it before B.C. 500. Herodotus, however, who lived after this date, says nothing about it; yet this is not so strong an objection as it might appear at first, since Herodotus, consistently with the plan of his history, never mentions the Carthaginians, except incidentally; though it is certain that he knew much more about them than he has told us. The voyage of Hanno, which was originally written in the Punic language, has come down to us in a Greek translation, though probably mutilated; and may be seen in Hudson's *Collection of the Minor Greek Geographers*, vol. i.

When the Greeks were settled in Egypt under Ptolemy, the son of Lagus, one of Alexander's captains, (B.C. 323,) they necessarily became better acquainted with the Red Sea and the course of the Nile; and from this epoch we may date the extension of that trade with India, by which the products of the great Asiatic peninsula and of Ceylon were more generally diffused over the western world. This trade existed in great vigour under the Roman emperors, and we have an example of it as late as the sixth century of our æra, in the work of COSMAS. Indeed the origin of the trade between the Indian peninsula and Arabia, and Eastern Africa, belongs to a period anterior to any history; and this commerce has probably never been totally interrupted at any time since its commencement.

One of the most curious documents with respect to ancient navigation on the east coast of Africa, is contained in the Periplus of the Erythrean Sea, which goes under the name of Arrian. This work, which was probably compiled from various log-books and journals, may be assigned to about the time of Pliny the elder, or perhaps to an earlier period. It has been illustrated, generally in a very satisfactory way, by Dr. Vincent. The Periplus contains much valuable information on the Red Sea, and also a description of the coasts of Arabia, Persia, the western coast of India, and the eastern coast of Africa. The extreme south point mentioned on the African coast is Rhapta, which Dr. Vincent thinks to be identical with Quiloa. It would seem as if this work was intended for the use of merchants, as the compiler has carefully mentioned the articles of export at each place of importance, and also has informed his readers what kind of commodities would meet with the readiest sale.

From the tables of Ptolemy, the Greek geographer, it appears that the coast of western Africa was known, probably though the navigation of the Carthaginians and the Romans, as far as to 11° north of the line. It is a curious question whether the ancient geographers were acquainted with the countries south of the Great Desert, and with the upper part of the river Quorra, commonly called the Niger. Herodotus tells a story, which he heard from some people of Cyrene, of some young men of the Nasamones, a tribe near the present gulf of Sidra, crossing the desert in a westerly direction, and coming to a great river which ran towards the rising sun, and had crocodiles in it, and black men living on its banks. It is very hard to give implicit credit to all the circumstances of this narrative; and yet it deserves great respect, because there are real facts corresponding to the description. The nature of the narrative, however, is such as to render it impossible to demonstrate satisfactorily either the truth or falsehood of this early discovery. But there are other considerations which must not be omitted in forming an opinion as to the knowledge which the ancients had of central Africa. It can hardly be imagined that the powerful state of Carthage, which employed so many elephants in war, and carried on so extensive a commerce, could be altogether ignorant of the countries south of the Great Desert. The elephant, we have no reason to believe, was ever an inhabitant of the Atlas regions, except so far as it was domesticated among the Carthaginians, and therefore must have been brought to Carthage from central Africa; while the articles of commerce, which the interior now furnishes to the coast of Tripoli, were commodities in which the Carthaginians used to deal, such as slaves, ivory, gold, &c. As to any objections raised to this statement about the elephant, from Pliny's assertion that it was found in Mauritania, we well know how to estimate that writer's evidence on such points; it is indeed of very little value, even though supported by Strabo, and the Periplus of Hanno. Seleucus Nicator kept a stud of 500 elephants

(Strabo, xvi. p. 752) at Apameia, and he had to bring them a greater distance than the Carthaginians would have, if they procured them from central Africa. The Carthaginians themselves had extensive elephant stables and grounds near the city. (Strabo, *Casaub.* 832.) When the Romans became masters of North Africa, we might expect to find them attempting, according to their usual policy, to enlarge their empire or their influence to the south; and we have, in fact, in Pliny, a distinct account of Suetonius Paullinus, A.D. 41, crossing the great mountains of Atlas, and going some distance south; and, in Ptolemy, we have an account of a Roman officer, Maternus, who set out from the neighbourhood of Tripoli, and went a four months' march in a southern direction. This route must have brought him into the latitude of Timbuctoo, and into the neighbourhood of the Tchad; and if the story is true, the great river, now commonly called the Niger, might have been thus known to the Romans. In examining the tables of Ptolemy, in which the positions of places are laid down according to their latitude and longitude, we find no reason to doubt their general accuracy along the western coast as far as N. lat. 11°. He has also given the position of a number of places in the interior, on a river which he calls Nigir; and the direction thus assigned to the river will come as near the truth as we could expect it to be, even if we knew Ptolemy's tables to be constructed upon real observation, such as was practicable at that time. A complete discussion of this question is given in the second Number of the Journal of the Royal Geographical Society of London, by Col. Leake, who is in favour of the opinion that the Joliba of Park, commonly called the Niger, was known to the Romans, and to Ptolemy, who constructed his tables from all the materials accessible to him in the rich commercial city of Alexandria, where he lived.



The Fortunate Islands (now the Canaries) were known to Ptolemy, and he reckons all his eastward distances or longitudes from them, or from some one point in them; for he does not appear to have known anything accurate as to the relative position of these islands. And as coasting voyages had considerably extended the knowledge of the east coast of Africa, without however showing any termination of the land, Ptolemy concluded that the southern parts of Africa joined the eastern parts of Asia, and thus he converted the Indian Ocean into an inland sea.

The Greek and Roman writers mention the following remarkable African animals with which they were acquainted:—the crocodile and the hippopotamus, both in the Nile and the rivers of western Africa; the giraffe, or camelopard; the elephant; the two-horned rhinoceros; and the ostrich. With the exception of the hippopotamus, all these animals were at different times seen in the Roman capital. The camel is not mentioned as being found in

Africa by any ancient writer, we believe, except Herodotus (vii. 69, 86, iii. 9), and it is therefore concluded that it was introduced into this continent by the Arabs: this opinion will be noticed under the head of AFRICAN ZOOLOGY.

On the occupation of Egypt by the Arabs in the seventh century of our æra, and the spreading of this conquering people through Africa, the regions south of the Sahara soon became known to them, and felt the influence of their religion and their arms. The Moors have now for centuries been in the habit of sending caravans across the Desert to Sudan, as the country south of the Sahara is often called, and they accordingly possessed some knowledge of these central regions long before they were visited by any Europeans. But the accounts of the Arabic writers cannot be said to add much to the information contained in the Greek and Roman writers, if we admit that the evidence is satisfactory as to the acquaintance of the latter with the regions south of the Great Desert. With the exception of Leo Africanus and Ibn Batuta, the latter of whom, in the fourteenth century, visited the banks of the Joliba, it does not appear that any of the extant Mohammedan writers were personally acquainted with Sudan; and their accounts must therefore have been derived from the merchants who accompanied the caravans.

Edrisi, who studied in Cordova, and wrote his book in Sicily (about A. D. 1153), can only be considered as a geographer, and not a discoverer. He was a native of Ceuta in Africa, but never travelled in that country, as far as we know. Ibn Batuta, who was a wanderer for thirty years in Asia and Africa, crossed the Sahara from Segelmessa, and visited Sego and Timbuctoo. The work of Ibn Batuta, which is very imperfect, has been translated by Professor Lee of Cambridge. John Leo, an Arab of Granada, commonly known by the name of Leo Africanus, also crossed the Desert in the early part of the sixteenth century, and visited the cities on the banks of that great river which has given rise to so many conjectures. Leo wrote his work on Africa at Rome, during the pontificate of Leo X. According to some accounts, it was already written in Arabic when he was taken prisoner by the Christian corsairs and presented to Leo, at whose request he translated it into Italian during his residence at Rome.

Though the descriptions of the Arab geographers are often vague and unsatisfactory, they still show in some directions a more extensive knowledge of Africa than the Greeks and Romans have left on record; and indeed their accounts have been sometimes singularly confirmed by the inquiries of our own age. As an example, we mention the description given by Ibn-el-Wardi of the natives on the east coast of Africa, of their selling their children for slaves, filing their teeth to a point, and other peculiarities still found among the people of that coast. [See Salt's *Abyssinia*, p. 56.]

II. The only portion of the west coast of Africa with which European navigators were acquainted at the beginning of the fifteenth century was that between the Straits of Gibraltar and Cape Nam, or Nun, or Non, in lat. 28° 40′, an extent of not much more than six hundred miles. From this point commenced that career of discovery, by the Portuguese, by which the entire coast of Africa has been made known to the modern world. The history of the Portuguese navigations has been written by various authors of that nation, whose accounts do not perfectly agree in all particulars. The most voluminous and elaborate work on the subject is the *Asia* (otherwise entitled the *Decades*) of John de Barros, which has not, we believe, been translated either into English or French, although a very brief abstract of part of it in the latter language, professing to be a translation, is to be found in the Collection of Voyages by Melchisedech Thevenot. The other principal authorities are Osorio's *History of the Portuguese during the Reign of Emanuel* (of which there is an English translation), the *Asia Portuguesa* of Manuel de Faria y Sousa (also translated into English, as well as into Italian and French), the *History of the Discovery and Conquest of the East Indies*, by Castañeda, (part of which has been translated into English,) and the *Tratados* of Antonio Galvam, of which there is an English version in Hakluyt.

The original promoter and for a long time the director of these expeditions was Prince Henry, a younger son of John I., commonly called the Bastard, King of Portugal, and of his wife Philippa, daughter of John of Gaunt, and sister to Henry IV. of England. The curiosity of Prince Henry had been first excited about the unexplored parts of Africa, by the accounts of the country of Guinea, and the kingdoms in its neighbourhood, which he had received from the Moors. Animated by the desire to acquire further information respecting these mysterious regions, he took up his abode, in his twenty-first year, at Terçanabal, in the Bay of Sagres, not far from Cape St. Vincent, the point of his native country nearest to the coast of Africa, and prepared to devote the remainder of his life, as in fact he did, to the task of achieving the circumnavigation of that vast continent.

Before this, however, a single ship appears to have been sent out, in the year 1412, by King John, which had doubled Cape Nun, although other accounts say that this exploit did not take place till 1415, when it was accomplished by two small vessels dispatched by the Prince. The navigators advanced for about sixty leagues farther along the coast, which was found continually to trend to the south-west; when at last they came upon a point which projected so far into the sea, and was lashed by the waves with such fury, that they were afraid to attempt to pass it, and returned home. This formidable promontory, since known by the name of Cape Bojador, that is, Projecting or Round Cape, (in lat. 26° 20′,) does not appear to have been doubled till 1432, or 1433, when, after several attempts, it was at length doubled by Gilianez, by whom also its present name was given to it. Meanwhile the isle of Porto Santo, one of the Madeira group, had been accidentally discovered in 1418, by Zarco and Tristan Vaz, who had come upon it in a storm.

In 1419, the island of Madeira itself (properly written Madera) was discovered by the same navigators; but this island had been visited long before, both by the unfortunate English captain, Macham or Machin, in 1344, and by the Spaniards in 1421. It was first called St. Laurence, and afterwards Madera, from the Spanish word for *wood*, having been covered with forests, which, being set on fire, are said to have burned for seven years.

In a second expedition, in the year 1434, Gilianez advanced about thirty leagues beyond this cape, and landed on a coast, where he saw men and flocks, and to which, from a fish which he found there, he gave the name of the Angra de Ruivos, or Bay of Gurnets. In 1440, Antonio Gonzalez proceeded as far as to Cape Blanco, in lat. 20° 47′, which, however, was only in 1443 doubled by Nunno Tristan. The latter navigator also discovered at the same time the isles of Adeget and las Garças (or the hawks), two of the Arguim or Arguin group, lying immediately to the south of the cape. The Portuguese afterwards formed a settlement in these islands.

In 1444, a number of individuals in the town of Lagos in Portugal formed themselves into a company for the prosecution of African discovery; and an expedition, fitted out at their expense the same year, discovered and took possession of two of the other Arguin isles, named Nar and Tider. In 1446, Dinis Fernandez sailed as far as to Cape Verde, in lat. 14° 48′, along a coast running nearly due south from Cape Blanc. Next year, Lancelot (or Lançarote, as he is called by the Portuguese writers) discovered, between Cape Blanco and Cape Verde, a great river called by the natives Ovedec, but to which he gave the name of Sanagà or Canagà, being, say Barros and Sousa, that of a Moor whom he put ashore at the place. But it was doubtless the name not of the individual, but of his nation, which he gave to the river; which was really, therefore, named, as Rennell, apparently without recollecting the statement of these writers, has conjectured, from the Senhaji or Assanhaji, in our maps the Zenhaga, and the Sanhagæ of Edrisi and Abulfeda, who inhabit its northern bank.—(See *Geography of Herodotus*, vol. ii. p. 28, note. Edition of 1830.) It is the same which is called in English maps the Senegal.

Lancelot also on this voyage touched at the isles of Palma and Gomera, two of the Canaries, which group, however, was known to the ancients, and had been re-discovered and in part taken possession of by the Spaniards about a century before this time. In 1447, Nunno Tristan advanced about sixty leagues beyond Cape Verde, along a coast now trending to the south-east, and discovered the Rio Grande, in sailing up which he was attacked by the natives, and killed, with the greater part of his men. The following year, the Azores—which, although lying nearly due west from Lisbon, have been considered by Malte-Brun, and other geographers, to belong properly to Africa—were discovered by Gonzalo Vello, and about twelve years after colonized under the auspices of Prince Henry, to whom a patent or charter was granted for that purpose by his nephew King Alphonso V.

In 1449 (Sousa says 1460, and other authorities 1462) the Cape Verde islands, the nearest of which lies about 300 miles west from that promontory, were discovered by Antonio di Noli, a Genoese in the service of Prince Henry. The prince died in 1463, at the age of sixty-seven; but the zeal for African discovery, which, in the face of long-continued ridicule and opposition, he had so far fostered, was now become a national passion, and the work of prosecuting what had been so well begun was taken up by the government. The coast of Sierra Leone, about 200 miles south of the Rio Grande, was reached in 1467. By the year 1469 the navigation had advanced as far as to the portion of northern Guinea, called the Grain Coast from the cochineal (then, and for a long time afterwards, erroneously supposed to be a vegetable seed) thence obtained; and in the course of that year Fernando Po discovered the island in the Bight of Biafra, now known by his name, but at first called Hermosa (the Fair). Fernando Gomez now obtained from the government, at a rent of 500 ducats, a monopoly of the commerce to Guinea for five years, binding himself during that period to explore 500 leagues more of the coast. Soon after were discovered Prince's Island (about lat. 1° 50′ N.), that of St. Thomas (nearly on the line), and that of Anno Bom (about 1° 40′ S.). In 1471, John de Santarem and Pedro de Escalona advanced as far as Cape St. Catharine, in lat. 2° 30′ S. This was the farthest point reached during the reign of Alphonso, who died in 1481, and was succeeded by his son John II. That same year the Castle or Fort of St. George of Elmina (the mine) was built by the government near the mouth of the river called Oro da Mina, on the Gold Coast, and became henceforth the capital of the Portuguese settlements; and soon after the new king added to his other titles that of Senhor de Guiné (Lord of Guinea). After this the circumnavigation of Africa was prosecuted with renewed spirit. The deep Gulf of Guinea had now carried the coast about 27°, east of the meridian of Cape Verde, and it was not found again to recede westwards. In 1484 took place the voyage of Diego Cam. He sailed from Elmina, and advanced as far as the River Congo or Zaire, the outlet of which is about lat. 6° S., after having ascended which for some miles he returned, and pursued his way along the coast till he reached first what he called Cape St. Augustine (in lat. 13° S.), and after that Cape Cross, or de Padrono (in lat. 22° S.). At each of these points he set up a great cross of stone, having inscribed upon it the king's name and his own, with the date and other particulars of its erection.

The next was the celebrated voyage of Bartholomew Diaz, who, setting out with three ships, was commanded, if possible, to pursue his course to the south until he should arrive at the extremity of the continent. Having accordingly passed the farthest point reached by Diego Cam, he proceeded until he came to what is now called Sierra Parda (in lat. 24° S.), where he erected his first cross, calling it Padraõ de Santiago. He then passed on till he reached Cape das Voltas (about lat. 29° S.), where he was detained for five days. On leaving this station he was driven out to sea, when, attempting to regain the coast, he came to what he named the Angra dos Vagueiros (or Bay of Herdsmen), and found the land stretching to the north. He had, in fact, doubled the terminating point of the African continent without knowing it. He continued his voyage past the Bay of Herdsmen till he came to a small island in the recess of Algoa Bay, which he named Santa Cruz, or the Holy Cross (in lat. 33° 45′ S.), where his crew, according to Barros, compelled him to put back after he had erected his second cross. Other accounts, however, state that he proceeded for about twenty-five leagues beyond this, when he found himself at the mouth of the river Del Infante, so called after the second captain, by whom it was first perceived. On his way back, Diaz came in sight of the long-sought promontory which we now call the Cape of Good Hope, the name given to it by the Portuguese king; but Diaz himself had named it Cabo Tormentoso (the Cape of Tempests), from the stormy sea which he encountered in its neighbourhood. The Cape of Good Hope was also sometimes called at first the Lion of the Sea, and the Head of Africa.

The beginning of the year 1493 was signalized by the return of Columbus from the discovery of America, then imagined to be the western termination of India with respect to Europe, and thence named the West Indies. But this was not the only great achievement in navigation which marked the close of this century. John II. of Portugal died in 1495, and was succeeded by his cousin Emanuel, surnamed the Great, who, with the throne, inherited all the zeal for maritime discovery which had distinguished its late possessor. Under his direction Vasco de Gama set sail on the 8th of July, 1497, to attempt the passage to India by the course around the extremity of Africa discovered by Diaz. In the prosecution of this enterprise, De Gama, after having doubled the Cape of Good Hope on the 19th of November, and put in at the bay of San Blaz, sixty leagues beyond it, left that station on the 8th of December, and on the 16th passed the island or rock of Santa Cruz, where Diaz had erected his last cross. He then came to the mouth of a river which he named Dos Reis (the River of the Kings), from having discovered it on Epiphany day. The part of the coast to the south of this he had called Tierra de Natal, in allusion to the season of Christmas. To the portion beyond, where he had some intercourse with the natives, he gave the name of the Land of Good People. The next place at which he touched was the Cabo de Correntes (that is, the Cape of Currents), near the tropic of Capricorn; from which keeping out to sea, he passed the river and rather deep of Sofala, without having observed the town there situated. Continuing his course to the north-east, he next arrived at the Port of Mozambique (in lat. 15° S.), but did not land, having discovered a plot of the Arabs there established to effect his destruction. By mistake he passed Quiloa, at which he had intended to put in, having been falsely informed that its inhabitants were Christians; and the force of the currents preventing him from making his way back, he pushed forward for the town of Mòmbaça, which stands upon a projecting point of the coast in lat. 3° 30′ S. From this station he was also induced to take his departure after remaining about a week, on discovering reason to believe that some treachery was intended him; when he set sail, and the same day arrived at the town of Melinda, about fifty miles farther to the north. Here he remained for some days, and then, leaving the coast of Africa, steered right across the ocean to India. On his return from this great expedition he passed in sight of the town of Magadoxa (more correctly Mukdeesha), in lat. 3° N., and also, in proceeding along the coast, touched at some other places besides those which he had visited in his voyage out. The ships of Portugal had now, therefore, navigated the whole extent of the African coast, from the Straits of Gibraltar to the Straits of Bab el Mandeb at the entrance of the Red Sea, with the exception of the space of about a thousand miles from the latter straits to Mukdeesha. They had ascertained the general shape of the continent to this extent, and the position, at least, of most of the principal rivers and headlands. To the nations of Europe the whole of the coast, the line of which had thus been traced, had been before entirely unknown, excepting, as already mentioned, the six hundred miles, or thereabouts, extending as far as to Cape Nun. But the Arabs had long been acquainted with the greater part of the east coast, along which Vasco de Gama passed after doubling the Cape of Good Hope; and the several great towns which he saw or heard of, from Sofala onwards to Magadoxa, were, in fact, for the most part, settlements which they had established, and where they possessed, in all cases really, in some cases also nominally, the supreme authority. The chief of these Arab settlements was the town of Quiloa.

But, in addition to this acquaintance with the coast, the Portuguese, in course of time, also acquired considerable knowledge of the inland country, partly through the establishments which they soon began to form at different points, and partly by means of information that was brought to them from other parts by the natives. One of the main objects kept in view in their early expeditions was the discovery of the residence of the mysterious personage known under the name of the Priest John (Preste Joaõ) or Prester John, as it has been Englished, of whom we shall only say here that, whoever he may have really been, he was, from the first intercourse with Abyssinia, taken to be the Emperor of that country. About the time of Diego Cam's voyage to the Congo, commercial relations were entered into by the garrison of Elmina with the King of Benin, the region lying at the head of the Gulf of Guinea; and from the people of this kingdom, intelligence was received of a great potentate whom they called King Ogané, living at a place 250 leagues in the interior, from whom each sovereign of Benin, on his accession to the throne, was said to receive a sort of investiture. It was immediately concluded by the Portuguese, that this could be nobody but Prester John; but Ogané was, no doubt, merely one of the great mo narchies in the interior, in all probability that called Ghana by Edrisi, and Kano by Clapperton, which, although now much reduced, is represented as having been formerly one of the most powerful in Africa. In 1487, also, two persons were sent out from Lisbon to attempt to find out the dominions of Prester John, and a route to India by land; and one of these, proceeding by Cairo and Aden, reached Goa in India, returned thence by Sofala, and afterwards penetrated into Abyssinia, where he was detained for some years. At Sofala he heard of the great island of Madagascar, called by the Portuguese at first St. Lawrence, the existence of which, however, had been long before made known to Europe by Marco Polo. Several natives of Africa, likewise, were at different times induced to visit Lisbon. Immediately before the adventurers we have just mentioned set out on their enterprise, a negro prince named Bemoi, from the nation of the Jaloffs or Yaloffs, to the south of the Senegal, arrived in that city to solicit the assistance of the Portuguese to replace him on his throne, from which he had been driven by some rival. This application afforded those to whom it was made a favourable opportunity of introducing themselves into this part of Africa, of which they immediately took advantage. They soon formed various establishments in the space lying between the Senegal and the Gambia, and along the banks of these rivers; but although they eventually spread themselves to such an extent in this district as to create a large population of mixed Portuguese and African blood, it is not exactly ascertained how far they actually penetrated into the interior. They, also, however, in course of time, acquired important settlements further to the south, along the banks of the Zaire, and in other parts of Congo; and the information which was obtained during the earlier period of their domination here respecting the geography of that and the neighbouring regions has been more fully given to the world. It was derived principally through the successive missions which were sent out, in the course of the seventeenth century, to attempt to christianise the inhabitants; and the greater part of it is to be found in Labat's *Relation Historique de l'Ethiopie Occidentale*, published at Paris, in 5 vols. 12mo., in 1732, with maps by D'Anville. The country actually traversed by the missionaries may be generally described as extending along the coast from Cape Lopo Gonzalves, in lat. 0° 44′ S., to the town of San Felippe de Benguela, in lat. 12° 14′ S., and as far in the interior as to Concabella, on the Zaire, about 400 miles from the mouth of that river, and to Massignan, about 100 miles up the more southerly river called the Coanza. They also obtained some information respecting parts beyond these points, which they did not visit. Finally, this nation very soon, also, established themselves along the east coast of Africa by the conquest of Quiloa, Mombaza, and Melinda from the Arabs, effected in 1505, and by the forts which they subsequently built on the island of Mozambique, (which became the capital of their eastern settlements,) and along the banks of the river Zambezi, a short distance to the north of Sofala. From these positions they obtained accounts more or less accurate respecting the whole coast of Zanguebar and Ajan as far north as to Cape Guardafui, which may be found in Barros. They had also some intercourse with the Macooa or Makooana, whose territory, lying some days' journey from the coast, is described as extending from behind Melinda as far south as to the Zambezi. On that river they have still factories at Tete, nearly 400 miles from its mouth, and at Zambo, which is almost twice that distance inland. The most recent account which has been given to the world of the Portuguese settlements both on this and the opposite coast, is Mr. Bowdich's work entitled *An Account of the Discoveries of the Portuguese in the Interior of Angola and Mozambique*, Lond. 1824. This volume, the information presented in which was derived partly from original manuscripts and partly from the communications of Count Saldanha de Gama, who had been for some time governor-general of Angola, contains maps of the country between the two seas, as far as it is known. In Mr. Bowdich's map, Manica, which is the principal mart for the trade carried on with the natives by the settlers on the east coast in gold, ivory, and slaves, is placed nearly on the 19th parallel of latitude, and in long. 31° 30′ E. from Greenwich.

It has been maintained by some writers that, long before Cape Nun was passed by the Portuguese, settlements had been formed on the coast of Africa by the French, very far to the south of that Cape. The Abbé Labat, to whom we have just referred, and after him the Abbé Demanet, in his *Nouvelle Histoire de l'Afrique Française*, 2 tom. 12mo., Paris, 1767, assure us that so early as the middle of the fourteenth century, the merchants of Dieppe had establishments and a trade at Rusisque, three leagues south from Cape Verde, and that by 1364 they had extended their intercourse as far as to the river of Sierra Leone. In 1365, these writers go on to say, a company was formed at Rouen for African commerce, which, the following year, founded depôts at Rusisque, on the Niger (by which is meant the Senegal), on the Gambia, on the Sierra Leone river, and along the Grain coast. One of these settlements, it seems, was called Little Paris, and another Little Dieppe. In 1382, the company built the Fort of La Mine d'Or, on the Gold coast, and also those of Acora, Cormentin, and others. All these establishments, however, they after some time abandoned, except those on the Senegal. As the authority for this history the Norman chronicles are appealed to; but still we cannot yield it our unhesitating belief. What is more certainly known with regard to the early intercourse of the French with the west coast of Africa, is that they appear to have been in the practice of sending four or five ships annually from Normandy to the river Gambia, soon after the middle of the sixteenth century. This is mentioned by the writer of the account of an English voyage to the Guinea coast, in 1591, printed in the second volume of Hakluyt's Collection. The company to whom these vessels belonged were certainly also possessed of some settlements in the neighbourhood of the Senegal, when, in 1664, they were compelled to sell them to the West India Company, that year established by royal charter. This association, however, broke up in 1673, when its African establishments fell into the hands of a new company. The Dutch had by this time obtained possession of the isles of Goree and Arguin; but they were driven from both in 1678 and the following year, by an armament sent from France under the conduct of the Count d'Estrées; and at the peace of Nimeguen these conquests were retained by the French king, who gave them up to the company. Demanet states, that, by treaties with the native princes, possession was subsequently obtained of all the coast from Cape Verde to the river Gambia,—being an extent of about fifty leagues—and to the depth of six leagues inland. French Africa, however, eventually comprehended much wider limits than these, stretching from Cape Blanco to Sierra Leone, or over about thirteen degrees of latitude, and going back also into the interior along the Senegal for some hundreds of miles. We do not mean that the company had acquired the sovereignty of all this territory; but that their settlements were spread from one extremity of it to the other.

The French African Company, however, repeatedly failed as a commercial speculation; and besides the one formed in 1673, which became bankrupt in 1681, two others had been successively associated and dissolved, when, in 1717, the trade was, by an edict of the crown, transferred from a third to the famous Western or Mississippi Company then newly established. On the failure of this short lived scheme the African settlements were taken possession of by the crown, and the trade left free. France still possesses, in this part of Africa, some inconsiderable settlements.

Several journeys into the interior were undertaken by the French residents at the mouth of the Senegal about the close of the seventeenth and the commencement of the eighteenth century, accounts of which are given in Labat's *Nouvelle Relation de l'Afrique Occidentale*, 5 vols. 12mo. Paris, 1728. The most important of these were the voyages performed up the Senegal by the Sieur Brue, the manager of one of the companies, in 1697 and 1698. In the former year he ascended the river for about 400 miles, when he landed at Ghiorel, on the north bank, and proceeded across the country to Goumel, the capital of the king of the Foulahs, about thirty leagues distant. On his return from this journey he established a factory at Ghiorel. The following year he again proceeded up the river, and visited several more remote parts of the kingdom of Gallam. The town of Dramanet, the principal port of that state, he found to contain 4000 inhabitants, who traded with Timbuctoo, which they described as lying about 500 leagues further inland. The French afterwards established a factory at Dramanet. He extended his voyage up the river as far beyond this point as to the cataract of Felu, and then leaving the water passed that barrier by land, intending to proceed to the cataract of Govinea, forty leagues higher up. But the apprehension of the water becoming too shallow from the heat of the advancing season to carry him back, induced him to return without accomplishing that object. He heard, however, while in Gallam, of the kingdom of Kasson, situated to the north-east of it, and of Bambarra beyond that. East of Bambarra, he was told, lay Timbuctoo, and beyond that the kingdom of Ghingala. He was also positively assured by some of his informants (although the statement was contradicted by others) that the Niger, which he supposed to be the same with the Senegal, flowed not towards the west, but towards the east, as it passed Timbuctoo.

It was not till some years after this time, that the French appear to have heard of the kingdom of Bambouk, lying to the south of Gallam, although it had formed part of the conquests of the Portuguese, whom, however, the natives had expelled after long experience of their oppression. But no sooner was intelligence obtained of the gold dust and mines in which it was said to abound, than the avidity of the new colonists of the Senegal was powerfully awakened, and every effort was employed to penetrate its frontiers, an attempt rendered infinitely difficult and hazardous by the vigilant jealousy of the inhabitants, who had not yet forgotten the miseries of European tyranny. The perilous undertaking, however, was at length accomplished in 1714, by M. Compagnon, who contrived to traverse nearly the whole of the territory. It was afterwards repeatedly visited by others of the French residents; and, in 1802 a full account of it was given in the first volume of M. Golberry's *Fragmens d'un Voyage en Afrique*, from the communications of the negroes and of the English established on the Gambia, from a work which he describes as printed in England in 1782, and from the memoirs of Governors Levens, David, and others, who had repeatedly been in the country between 1730 and 1744. M. Golberry's book has been translated into English. The kingdom of Gallam was also visited in 1785 by M. Saugnier, an account of whose journey has been published. The kingdom of Hoval, likewise, from which gum Senegal is brought, and which occupies the space between the Senegal and the Sahara, was early explored by the French settlers. An account of a journey thither by the Sieur Brue is to be found in Labat; and much additional information respecting the country is given in the work of M. Golberry.

Settlements upon the west coast of Africa were also early made in imitation of the Portuguese and French, first by the English and afterwards by the Dutch; and some of the English traders repeatedly ascended to a considerable height on the Gambia. The Danes have also some small establishments on the Guinea coast. But it is since the formation of the AFRICAN ASSOCIATION, in 1788, that the chief efforts have been made in the prosecution of discovery in the interior. The expeditions sent out by the Association and by government, and those undertaken by individual adventurers, have sought Timbuctoo and the Niger from various points. But no considerable progress was made till the first journey in 1795 and 1796 of Park, who on that occasion proceeding from the west coast in the direction of the Gambia, till he left it and turned to the north at Medina, after passing through the kingdoms of Bondou, Kasson, and Kaarta, reached Sego, the capital of Bambarra, and there beheld the Niger (called by the natives the Joliba, or Great Water) 'flowing slowly to the eastward.' Park advanced beyond this point to another town named Silla, on the same river, and also acquired some valuable information respecting the further course of the Niger and the position of Timbuctoo, which he was told was not more than 200 miles from Silla. He returned to the Gambia by a more southerly tract, following the course of the Niger as far up as Bammakoo, which was stated to be about ten days' journey from its source, and then proceeding through the mountainous districts of Manding, Konkodoo, and Dindikoo. On his second expedition, which was undertaken at the public expense, in 1805, this adventurous traveller, after again reaching Silla, embarked on the Niger at Sansanding in its vicinity, with the purpose of sailing down the river to its mouth, wherever that might be. He is ascertained to have passed in succession the cities of Jenné, Timbuctoo, and Yaour, or Yaouri, and to have been killed in the river at Boussa, a short distance below the last; but no part of his journal after he left Sansanding has been recovered. Meanwhile, now that the interest taken in African geography had become strong and general, a good deal of information was collected from a variety of sources respecting both the regions in the interior and some parts nearer the coast. Hornemann, who, in 1799, penetrated from Cairo to Mourzouk, in the desert, and on the line of the common route from Tripoli to Timbuctoo, learned many particulars which had not before been known in Europe respecting the countries to the east of Timbuctoo, and especially the kingdom of Bornou, then the most powerful state in Central Africa. Mr. Riley, supercargo of an American vessel, who had been taken captive by the natives in 1815, and carried into the interior, obtained from the information of an Arab merchant by whom he had been purchased, an account of the course of the Joliba, to a greater distance beyond Timbuctoo than previous notices had carried it; but his statements were evidently not to be altogether depended on. In 1816, an expedition sent out by government under the command of Captain Tuckey, to the Congo, in the idea that it would be found to be the same with the Joliba or Niger, ascended that river for about 280 miles, and also examined part of the adjacent country. At the same time, Major Peddie, and after his death Captain Campbell, conducted another party from the mouth of the Senegal through the Foulah territory as far as Kakundy. In 1817, Mr. Bowdich explored a part of the extensive territories of the Ashantees, surrounding, on the north, east, and west, the district of the Fantees, who occupy that part of the coast of Guinea where the English settlement of Cape Coast Castle is established. In 1820, very considerable additions were made to the knowledge formerly possessed both of the geography and the people of interior Africa, by the publication of Mr. Jackson's account of the territories of Timbuctoo and Houssa, from the communications of El Hage Abd Salam Shabeeny, a Mussulman merchant, who had visited these states. This year also appeared at Paris the account of a journey made by M. Mollien to the sources of the Senegal and the Gambia, in which, setting out from the isle of St. Louis, at the mouth of the Senegal, he traversed the country in a south-easterly direction as far as the town of Timbo, nearly in 10° N. lat. and above 14° W. long. from Greenwich. Some further information was also obtained by means of the expedition of Messrs. Ritchie and Lyon, who, in 1819, penetrated from Tripoli to Mourzouk; and from the journey performed, in 1821, by Major Laing, from Sierra Leone, through the Timannee, Kooranko, and Soolima countries.

But a more important and successful attempt than any which had been hitherto made to explore the interior of Africa was that of Major Denham and Lieutenant Clapperton in 1822. These travellers, setting out from Tripoli along with a caravan of Arab merchants, crossed the desert and reached the great inland sea or lake called the Tchad, the coasts of which, to the west and south, were examined by Major Denham, while Lieutenant Clapperton proceeded to the westward through the kingdom of Bornou and the country of the Fellatahs, till he arrived at Sackatoo, situated on a stream which probably runs into the Joliba. A great mass of information respecting these hitherto unvisited regions, lying to the east of Timbuctoo, was obtained in the course of this expedition; but not much that could be depended on was learned as to the remaining course of the Niger, or the Quorra, as it was found to be called at Sackatoo. It was very generally stated to flow into the sea at Funda, but where that place was could not be exactly ascertained. Soon after Clapperton's return to England, however, he was sent out by the government in the command of a new expedition, the plan being that he should endeavour to penetrate to the scene of his former adventures from the coast of Guinea. He accordingly set out for the interior from Badagry, a short distance to the east of Cape Coast Castle, and taking a north-easterly direction proceeded through the kingdom of Yarriba, or Eyeo, till he reached the Niger at Boussa, where Park perished. Crossing the river, he entered the kingdom of Nyffe, after traversing which, and some of the adjoining districts as far as the great commercial city of Kano, the capital of Houssa, where he had been in his former journey, he turned again to the west, and, reaching Sackatoo, there died. His servant, Richard Lander, afterwards returned to Kano, and proceeded thence through the kingdom of Zegzeg, a considerable way towards the south, intending to embark on one of the branches of the Niger, and, if possible, to solve the grand problem of its termination by sailing down the stream. But he was stopped by the natives, and compelled to turn back when he had got as far as Dunrora, which he understood to be due west of Funda, and at no great distance from it. Meanwhile, Major Laing, already mentioned, had succeeded in making his way across the desert from Tripoli to Timbuctoo, in August, 1826, and had transmitted some brief notices of that famous city, where he spent some weeks. But he was murdered on his return, in the desert, and none of his papers have yet been recovered. There has also been lately published an account of a journey from Sierra Leone to Timbuctoo, performed by a M. Caillé, a native of France; but although the truth of his narrative in its principal statements is now generally admitted, it is so extremely loose in its geographical details, that it cannot be said to have added much valuable information to our knowledge of the countries to which it relates. The discovery of the long-sought termination of the Joliba, Quorra, or Niger, however, has since been effected by the fortunate and well-conducted enterprise of Richard Lander and his brother. Leaving Badagry on the 22d of March, 1830, these two travellers, following nearly the same route which had been taken by Clapperton through the kingdom of Eyeo, reached Boussa, on the 17th of June. They afterwards ascended the river as far as Yaouri, from which they returned to Boussa, where they remained for some time, and then embarked on the river which they hoped would conduct them to the sea. In this expectation they were not disappointed. After various adventures, Richard Lander had at last the happiness, on the evening of the 18th of November, to find himself at the mouth of the greater branch of the river, here called the river Nun, or the First Brass River, from the negro town of Brass which stands upon its banks a short distance inland. There is another great branch entering the sea a few miles more to the south, called the second Brass River. The traveller was afterwards joined by his brother; and the two reached Portsmouth together on the 9th of June, 1831. They left England again with two steam-vessels and a transport, which were built and fitted out by some spirited merchants of Liverpool for the purpose of attempting the ascent of the Niger, if possible, as far as to Sackatoo or Timbuctoo. This expedition sailed on the 27th of July, and the latest accounts that have been received of it were dated the 11th of October, 1832, at which time it had safely reached Cape Coast Castle.

The zeal for discovery in Africa, which has been so strongly felt within the last half century, has also sent out a succession of travellers to explore the southern regions of that vast continent. The principal settlement in this quarter, that of the Cape of Good Hope, was founded by the Dutch about 1650, and remained in their hands till it was finally taken from them by the British in 1806. For more than a hundred years after the establishment of this colony, it occupied only the extreme angle of the African continent, or a part of the narrow stripe between the sea and the nearest mountains; nor does much information seem to have been obtained with regard to any of the native tribes, except the nearest Hottentots, lying beyond that boundary. The first traveller who penetrated any considerable way into the interior was Captain Henri Hop, who was sent out on an expedition of discovery by the Dutch governor in 1761, and traversed a considerable part of the country of the Namaquas. He was followed by the Swedish naturalist Sparrman, and by Vaillant, whose journeys were made between 1775 and 1785, and extended to the territory of the Bosjesmans, three or four hundred miles north from Cape Town. In 1797, the regions lying in this direction were traversed by Mr. Barrow from the territory of the Caffres in the east, to that of the Namaquas in the west, including the desert of the Great Karroo, and as far north as the foot of the Sneuwberg, or Snow mountains. In 1801, the great barrier formed by this range was for the first time passed by Messrs. Trutter and Somerville, who, crossing the Gariep or Orange River, penetrated as far as Leetakoo, or Lattakoo, the capital of the Boshuanas. Soon after another party, under the conduct of Dr. Cowan and Lieutenant Donovan, was sent out from Cape Town to cross the country to Mozambique, or Sofala, and accounts were received from them when they had advanced eleven days' journey beyond Lattakoo. But here, in the country of the Wanketzens or Wanketchies, the unfortunate adventurers appear to have been destroyed by the natives. A few years after, Dr. Henry Lichtenstein penetrated as far as Lattakoo, and brought back much more complete information respecting the Boshuanas, and the other tribes whose territories he traversed, than had been before obtained. Mr. Burchell also reached Lattakoo in 1812; and in the following year it was visited by Mr. John Campbell, the missionary. In 1820 the same gentleman returned to that capital, and proceeded thence as far east as to the hitherto unvisited city of Mashow, from which he directed his course northward till he reached Kureechanee, about latitude 25°. South-west from this last town he found himself on the borders of a desert which he was informed extended an immense distance to the westward. No traveller has since penetrated so far to the north as Mr. Campbell did in this journey; but in 1823, Lattakoo was once more visited by Mr. George Thompson, whose accounts of many parts of the country lying between this point and the colony, as well as of some of the Caffre tribes to the east, are much more complete than any that had before been given to the public. The map of South Africa, which is given in the second volume of Mr. Thompson's travels (Lond. 1827) is also, we believe, the fullest that has yet been published; but it is unfortunately so unskilfully lithographed as to be in many parts nearly illegible.

Our limits render it impossible to give even a brief sketch of the history of modern discovery in the Nile Valley, and other north-eastern parts of Africa not included in the above outline. We should not omit, however, the journey of Mr. Brown to Dar-Fûr in 1793, where he was detained nearly three years. Though his movements within Dar-Fûr were confined to a very limited space, his work contains a great deal of curious information on a country before that time totally unknown.

The expedition of the Beecheys in 1821 and 1822, from Tripoli eastward to the Great Syrtis and the Cyrenaica, has made us more intimately acquainted with a most interesting region, only imperfectly known from the earlier accounts of Della Cella and others.

Of Egypt we shall speak more particularly under that head, and for a brief notice of discovery in Abyssinia, we must also refer to that article. At the present time one of the missionary societies has its agents in Abyssinia, who, it is hoped, besides fulfilling the more important object of their mission, will add to our stock of information on that country, and thus by facilitating commercial intercourse, contribute still further to the social improvement of the numerous nations on this part of the continent. The travels of Caillaud to Chendy and into the kingdom of Sennaar (1822), and the travels of Rüppel in Nubia, Kordofan, &c., have added considerably to our knowledge of these regions. The latest expedition with which we are acquainted up the Bahr-el-Abiad, or main stream of the Nile, is that by Adolphe Linant, who, in 1827, advanced up this stream beyond Aleis. [See *Journal of London Geogr. Soc.*, vol. ii.]

The large island of Madagascar will require a separate notice. Our accounts of it are yet very incomplete, but we hope that the missionary settlements made in that island (since 1818) will gradually bring us still further acquainted with it. [See *Missionary Gazetteer*.]

III. The extent of the African coast, and the portions surveyed by each navigator, will be seen from the following tabular view:—

	Eng. Miles.	
From El Arish, 33° 55′ l. E. (a village near the conventional boundary line of Africa and Asia,) to Alexandria	238	There has been no actual survey of this part of the coast. Captain Gautier of the French navy merely sailed along and determined a few points on the coast.
From Alexandria to the Fratelli Rocks	1400	Surveyed by Capt. W. H. Smyth, R. N.
From the Fratelli Rocks to Cape Spartel	830	Partly surveyed by Capt. W. H. Smyth and the coast of Algiers by the French.
Cape Spartel to Cape Bojador	875	This part of the coast is but imperfectly known. The English and Spaniards have occasionally surveyed detached portions of it.
Cape Bojador to Cape Mirik	530	Cape Bojador to Cape Blanco was surveyed by Capt. Baldy, R. N.; and from Cape Blanco to Cape Mirik, the outer edge of the Bank of Arguin only, was surveyed by Baron Roussin; the line of coast not being visible.
Cape Mirik to Cape Verde	375	Surveyed by Baron Roussin of the French Navy.
Cape Verde to Cape Roxo	160	By Captain Boteler.
Cape Roxo to Tumba Point	300	Surveying by Capt. Belcher, R. N.
Tumba Point to the south side of Sherboro Island	150	By Capt. W. F. W. Owen.
South side of Sherboro Island to Cape Formosa	1470	Surveyed by Mr. Anthony de Mayne, Master R. N.
From the Cape Formosa to the Cape of Good Hope	3010	Surveyed by Capt. W. F. W. Owen, R. N.
From the Cape of Good Hope to Cape Guardafui	4550	Ditto, ditto.
Cape Guardafui to Ras Bir	610	This part of the coast has never been surveyed.
Ras Bir to Salaka	690	Now surveying by the East India Company's Marine.
Salaka to Suez	860	
	16,048	

IV. This enormous peninsula is attached to the Asiatic mass by the isthmus of Suez; but at two other points, the straits of Bab el Mandeb, and those of Gibraltar, it approaches close to the respective continents of Asia and Europe. The equator cuts it into two masses of unequal magnitude; though the extreme southern and northern coasts are, on an average, pretty nearly removed the same distance from the equinoctial line. The latitude of Ras el Krun near Bizerta is 37° 20′ N., and that of Cape das Agulhas, (Cape Needles,) the most southern part of the continent, is about 34° 50′S. The distance between these two points is about 5000 miles. The most remarkable projection of the African coast is that which terminates in the bold headland, called by the Portuguese Cape Guardafui, in N. lat. 11° 50′, E. lon. 51° 22′; this is the most eastern point of Africa. Its extreme western point is Cape Verde, N. lat. 14° 45′, W. lon. 17° 32′: the distance between these two capes, in a direct line, is not much less than 5000 miles.

The geographical position and coast line of Africa are characterized by lying for the most part within the tropics, and by the comparatively few deep indentations of the coast. Its northern shores are washed by the Mediterranean, and are the most irregular part of the African coast, presenting the indentations of the Arabs gulf, the large gulf of Sidra, and that of Cabes. Many parts of this shore, especially about the Sidra gulf, are low, but neither so sandy nor barren as some writers represent them; while the Cyrenaic regions, and a large part of the coast west of the Sidra, as far as the straits, is considerably elevated, and, perhaps, with the regions of Marocco, form the most favourable part of the whole African coast for the habitation of man. Only one river of any considerable magnitude, the Nile, flows from the African continent into the Mediterranean, but this is one of the most singular streams in the world, whose course the traveller may follow from the coast into the interior for above 1200 miles, without meeting with one single current that adds its waters to those of this mysterious river. The streams of the Atlas regions that enter the Atlantic, though numerous, are inconsiderable as to the volume of water: the chief is the Mejerdah, the ancient Magradas or Bagradas, which flows into the sea near Tunis, and is subject to periodical inundations in the lower part of its course; and the perhaps larger river Molooyah, which belongs to the empire of Marocco. The Atlantic washes the western coast of Africa, which, within the dominions of Marocco, presents a coast generally low, succeeded in the interior by fertile plains of immense extent. Numerous streams, some with a considerable length, of course, such as the Wad Seboo, Oom er begh, &c., flow from the Atlas into the Atlantic ocean within the limits of the empire of Marocco. South of this region, the arid character of the Sahara is found extending even to the shores of the ocean, and hardly disappearing before we arrive at the Senegal. From the Senegal to the Cape of Good Hope, the coast is now pretty well known, but the same minuteness of survey and of observation has not been applied to all parts of it. The great characteristic in its outline is the gulf of Guinea, the northern shores of which have a *general* direction east and west through 20° longitude. With the numerous rivers that flow into the Atlantic between the Senegal and Cape Negro, (N. lat. 16°,) we are still imperfectly acquainted; and the numerous openings that are observed on many parts of this coast indicate outlets of rivers, or channels formed by islands, which yet remain to be explored. The Senegal, Gambia, and Rio Grande, are the three largest rivers north of Sierra Leone, though the precise nature of the lower channels of the last-mentioned is not yet ascertained. Captain Belcher suspects the existence of an archipèlago of islands between the Rio Grande and the Nuñez. The late expedition of the Landers has determined the long doubtful question of the outlet of the Quorra in the bight of Benin; and the river Nun is now ascertained to be one of the several channels by which the Joliba of Parke discharges its waters into the Atlantic.

The great African river, south of the equator, is the Zayre or Congo, which is found, on ascending its stream, to show a less volume of water than would be inferred from its appearance at the mouth; but this is the case with other large African rivers, and leads to no safe conclusion as to its course being comparatively short. Between the Congo and Cape Negro there are numerous streams, such as the great Coanza, and others which are of minor importance when compared with the Congo and Coanza, which appear to be the great rivers of south-western, as the Zambezi is of south-eastern Africa. From Cape Negro or the Bambaroughe to the Orange river, we have a coast of 800 or 900 miles almost without fresh water. The Orange river is a large stream, perhaps the fourth or fifth among African rivers, whose course to the Atlantic is determined, though its numerous tributaries rise far in the interior, by the *general* slope of this part of the surface from east to west.

The Cape colony, within the limits now assigned to it, is now so far known, that its geographical features need not be noticed in this general sketch; but we may remark, that the common notion of Africa terminating in a point requires correction. The mountain ranges, and extensive plains which run east and west within the limits of the colony form a series of heights and terraces, which are bounded on the south by an extensive line of coast running in the same direction. From False Bay to the extremity of Algoa Bay, we have a line of coast above 400 miles long, running nearly due east and west, and presenting to the southern ocean as broad a front as the Spanish peninsula offers to the Atlantic.

The great known river of the eastern coast is the Zambezi, which, though low in the dry season, is provided with prodigious channels to receive the floods of the rainy months. Further north on this coast, near the site of Melinda, we find the outlets of streams from the interior; and it is *possible* that the Zebee here finds its way to the ocean; but, unlike the other south African streams, we are acquainted, from the narrative of Fernandez, with its upper course, which lies north of the equator, but not with its lower course near the coasts of the Indian ocean.

The great currents on the coast of Africa are too remarkable to be entirely passed over; but as those which are best known belong to the North and South ATLANTIC, a brief notice of that round the Cape will be all that is necessary here.

The great bank which lies off the coast of South Africa, and takes its name of Agulhas, or, as it is often incorrectly called, Lagulhas, from the cape of that name, has probably been partly formed by the action of currents. It is, indeed, probable that the main mass of it owes its existence to the same phenomena which produced the terrace lands of the Cape; but it has also received great accessions of sand and weed from the action of the currents. Two main streams, one from the Mozambique canal, the other from the open Indian Ocean, impelled by the S.E. trade-wind, unite nearly opposite to Cape Padron (26° 20′ E. long.). From the meridian of Cape Recif (25° 36′ E. long.) the main stream gradually turns to the west, and strikes on the great bank (in about 35° 30′ lat., 23° long.), by which its course is changed successively to W. 36° S. to S.W., and finally (in lat. 38°) it becomes rather east of south. The greatest portion of this current is actually turned round by the east edge of the bank, and finally mingles with a South Atlantic eastern current, and, impelled by it, thus returns into the Indian Ocean by a line nearly parallel to its original course. A *part* of the stream passes over the deep water at the southern extremity of the bank and turns towards the N.W., and then uniting opposite the Cape of Good Hope with another part of the main stream, (which *crosses* the northern part of the bank in a western direction, between 34° 45′, and 35° 40′,) forms a wide stream running to the N.W. as far as 25° S. lat., where it joins the N.W. current formed by the S.E. trade-wind. The existence and course of these currents are indicated not only by their actual motion, but also by their temperature. Off Cape Recif (Reef), where the temperature of the Mozambique stream was found (in June) to be somewhat lower than it was further north and east, it was still 68°, or 8° above the ocean temperature. On the bank, in lat. 35° 45′, it has been found 7° above ocean temperature; and diminishing westward towards the edge of the bank, it becomes of the ocean temperature for some distance before attaining its western extremity. But what is singular, and confirms the statement above made as to the current that *rounds* the Agulhas bank joining that which *crosses* it—the temperature rises again to 4° above the ocean temperature, *west* of the bank, as soon as the junction with the southern branch is effected. For further information on this current, the reader may refer to our authority (Major Rennell, *On the Currents of the Atlantic*, London, 1832). Salt, in his voyage up the Mozambique channel, found the current between Capes Correntes and Sebastian, setting strong to the south, so as 'to impede the course not less than sixty miles in twenty-four hours.' And further north (12° 37′ S. lat., 41° 24′ E. long.), Mr. Salt speaks of 'a strong current setting to the southward at the rate of thirty miles in twenty-four hours.'

On doubling Cape Guardafui the same writer experienced along the coast, a strong current that headed the ship; but the information which he gives about it leads to no conclusions. This current has no connexion with that just described.

The only other phenomenon of African currents, that requires a short notice here, is that part of the North African current, as Major Rennell calls it, which sets into the Mediterranean through the straits of Gibraltar. The great loss which the Mediterranean experiences from evaporation is supplied by a constant current pouring in from the Atlantic. This current is most obvious to the east of a line joining Cape St. Vincent in Spain, and Cape Cantin (32° 35′N. lat.) in Africa. The form of the coasts is like the wide part of a funnel, and the straits of Gibraltar are the pipe. It is probably owing to this rush of water towards the straits that an eastern current has been perceived, in summer, as far as the Azores, increasing in velocity eastward from the meridian of Cape Vincent. South of the latitude of the Canaries and Cape Bojador, the current, instead of pointing to the straits' mouth, sets upon the coast of the Great Desert, which is sandy and low. This current, from whatever cause it arises, is that which has brought so many ships on this inhospitable shore, navigators having been deceived in their reckoning by not estimating the force of the stream. Ships' crews that have had the misfortune to be cast on this savage coast, inhabited by a brutish race of barbarians, have frequently either perished of hunger, or been sold into slavery. [See Rennell.]

Africa seems to be a land of terraces, as indeed all widely extended portions of the earth's surface probably are. It would appear in general to rise from the coast into the interior by successive steps, which are spread out in widely extended plains. These are known to exist in some parts, such as in the Cape Colony, and are indicated in others by a regular series of falls in the beds of the great rivers—the Nile, Quorra, Congo, &c. We know from Tuckey's expedition up the Congo, that mountains of considerable elevation are found at no great distance in the interior; and the late expedition up the Zambezi, (see *London Geographical Journal*, vol. ii.,) in addition to former accounts, has confirmed the opinion of the country rising into considerable elevations in the interior. The numerous tributaries of the Zambezi, and the immense body of water which it brings down, indicate sufficiently its extensive course and the existence of elevated regions in the interior. But we are almost entirely ignorant of the conformation of all Southern Africa, with the exception of the Cape colony, and our limited knowledge of the coasts. The existence of a large chain like the Andes, as some have imagined, running north and south, is not only unproved, but improbable. The existence of elevated table-lands is, however, certain. There is no account of either native or European having crossed this immense continent south of the Sahara; nor have the Portuguese ever effected a line of communication between their settlements on the Angola and Mozambique coasts, though enterprising individuals and traders have on each side advanced far into the interior; and an instance is recorded of a person having crossed the country from Angola, on the west coast, to Tete, on the Zambezi river, at both of which places he had seen the Portuguese flag. [See Bowdich's *Account of the Discoveries of the Portuguese in Angola and Mozambique*.]

The mountain system of Africa must, in many cases, be inferred from the course of the great rivers. The high lands of Abyssinia, in which the Tacazze and the Bahr-el-Azrek rise, are in all probability continued westward, if not at so great an elevation, at least at a very considerable one. But whether these western regions run step by step to a central mountain range, or spread out in wide plateaus or deserts, we do not know. From this remote region the waters of the Bahr-el-Abiad, or true Nile, descend; and from a somewhat lower elevation, probably the Misselad and other streams that find their way into interior lakes. It seems now pretty certain that a range of land stretches across the continent, so as to separate the basin of the Congo from that of the Tchad Lake and its affluents, while the basin of the Quorra is again separated from that of the Tchad by a ridge of small elevation running in a northerly direction. But the distance from the supposed sources of the Bahr-el-Abiad to the high lands seen by the Landers from the Quorra in the neighbourhood of Funda is so great, that it would be a hasty assumption to suppose a mountain chain continuous across the continent. The high lands east of the Quorra, about Funda, seem to belong to the same elevation which runs west of the Quorra, and then north, and supplies on one side the water of the Senegal, Gambia, and other streams to the south, and on the other feeds the Joliba or Quorra.

The expeditions of Denham and Clapperton have made us acquainted with a large internal lake, the Tchad, which, from its extent and position, forms one of the most remarkable features in the physical geography of this continent. Africa, as far as we yet know it, contains comparatively few lakes. The lake of Maravi, about sixty leagues north of Tete, is still unexplored, but this has been no obstacle to assigning it a most prodigious length: that of Dembea in Abyssinia, Keroun in Lower Egypt, Dibbie, through which the Joliba flows, Fittrie, and the lakes of the Atlas regions, are all inconsiderable when compared with the Tchad, which, though its dimensions are not yet ascertained, must occupy a very extensive surface, especially during the rainy season. The elevation of the Tchad above the sea may probably not be more than from 400 to 600 feet.

The interior country watered by the Quorra, by the tributaries to the Tchad, and by other unknown streams that probably exist, may be in general described as a fertile region, well suited to the habitation of man, and apparently not possessing a climate unfavourable to life, either for the natives, or Europeans who know how to take care of themselves. This country, known by the general name of Soudan, cannot be accurately defined. Dar-Fûr would seem to be properly included in it, though it partakes also of the character of the neighbouring Sahara, and forms a kind of oasis; but the periodical rains from before the middle of June to the middle or end of September, and the presence of the elephant and hippopotamus in some parts of the country, mark these at least as belonging to the Soudan regions. The winds that fill Dar-Fûr with thick dust blow constantly from the south, and are the hot winds,—thus indicating a considerable extent of southern country of a low and sandy character.

The great characteristic feature of Northern Africa, the Sahara or Great Desert, would form a complete physical barrier between the Mediterranean and the interior but for the long and narrow valley of the Nile; which, in fact, bounded as it is in many parts on the west by a high rocky barrier of limestone, from which the traveller descends to the lower region of the western desert, may be considered as a separate portion of the continent. The broad belt of the desert stretching across the continent seems as if it were only interrupted by the Nile, to recommence with the same arid character in the broad wastes of Arabia and the Syrian desert. Arabia, in fact, in its physical conformation, belongs rather to Africa than Asia. But this extensive waste is not so uniform in its appearance as to be one mass of sand. Its surface is in various parts of very unequal elevation. Occasionally it rises into rugged barren ranges of hills, some of which, of limestone formation, contain marine shells; and sometimes, particularly in the eastern part, it is diversified with springs of water, both warm and cold, which give fertility to the small spots around them, which were called by the Greeks, oases, the same word as the modern wady. The Sahara, indeed, may be divided into two great divisions, of which the eastern is far more diversified with springs and habitable spots; the western portion, through which the traders from Marocco make their way to the Joliba, is the most barren, parched, and terrific waste on the surface of our globe. The abundant supply of natron (sesqui-carbonate of soda) and common salt contained in the salt lakes of the Sahara, and some which is found in a fossil state, has always furnished an important article of trade between the people of the desert and Soudan, where this necessary of life is wanting. The western portion of this desert is less known than the route from Mourzouk to Bornou, and presents, as we have said, a far more fearful and extended waste than the eastern division; it stretches westward to the very shores of the Atlantic, displaying on the coasts of the ocean the same desolate and sandy appearance. We have yet no observations sufficiently accurate or numerous to determine the general elevation of the Sahara, though there can be little doubt that it contains many uninterrupted levels of considerable height. (See SAHARA.)

The countries north of the Sahara from the southern limits of the empire of Marocco, nearly as far as the Gulf of Sidra, are sometimes comprehended under the general name of the Atlas regions, so called from the predominant mountain range to which that name is given. The various branches and the geological character of this range will be described under the head of Atlas. This region contains on the Atlantic coast fertile plains, bounded to the east by mountains covered with eternal snow. On the Mediterranean coast the level country is of much less extent, and the interior is a region of elevated ground filled with hills and mountains. Our imperfect knowledge of this interesting region will, no doubt, soon receive extensive accessions from the French and others who have settled in the territory of Algiers. The Arab geographers considered this tract as more European than African in its character and position, an opinion which the physical features of the opposite Spanish peninsula, with its Sierra Nevada, its climate and productions, fully justify. We cannot yet assign satisfactorily any eastern limits to the *physical* region, which may be considered as belonging to the Atlas country. The gulf of Cabes, or rather the promontory of Cape Bon, may perhaps be assumed as its extreme limit along the coast, while, in the interior, a mountain range, the Ghurian, of no very great elevation, extends at least as far eastward as the western side of the coast of the gulf of Sidra. To avoid these mountains, the Fezzan caravans sometimes take the route through Mesurata on the coast.

The high lands of the ancient Cyrenaica, now included within the limits of what is often incorrectly termed the *desert* of Barca, form a separate system, and will require a distinct description.

It has been often remarked that Africa shows few, if any, traces of volcanic action within historical periods, and the occurrence of earthquakes is not established on record, except within the limits of Egypt. But undoubted traces of the former action of subterraneous fire are to be found; for instance, on the west coast on the banks of the Nuñez, and most particularly in the Canaries, the Cape Verde archipelago, the small islands at the mouth of the Rio Grande, and those in the bight of Biafra. Jebel Teir, a small island in the Red Sea, is an extinct volcano.

The mineral treasures of this immense continent are of course very imperfectly known. Salt is perhaps one of the most universally diffused, being found from the salt lakes of the Cape colony to the northern coast, and yet extensive districts, as we have already remarked, such as the Soudan, are without it. But it occurs again south of the equator, and is plentifully procured from the salt quarries of Angola; and Brown mentions it also as being found in a fossil state in Dar-Fûr. It will probably be found on inquiry that the mineral treasures of Africa are nearly as various as those of other parts of the world, though at present less imperfectly known, and in many cases only observed at spots widely removed from one another. The mineral wealth of Egypt alone is considerable; and that of the interior west of the Mozambique coast is also abundant. Gold dust, however, is that which has the most excited the cupidity of Europeans; and this mineral is found in the sands of the upper streams of nearly all the great African rivers.

The following are the chief African minerals and earths known to commerce, or the useful arts, with some of the countries in which they are found. It should be remembered that they are found in other places than those here enumerated.

Gold.—Central Nigritia, Guinea coast, Mozambique coast, &c.

Silver.—Mines said to be at Chicova, up the Zambezi river. (See Bowdich, *Account of Discoveries*, &c.); Elala in S.W. part of Marocco.

Copper.—Mines of Fertit, south of Dar-Fûr; Atlas mountains; Egypt, &c.; the Moolwas; Zumbo, on the Zambezi, &c.

Iron.—Egypt; Dar-Fûr; on the banks of the Lucala, a branch of the Coanza; in the territory of the Cazembes, &c.

Tin.—Loango. (Bowdich.)

Salt.—Egypt, Tunis, Sahara, Angola, the Cape of Good Hope, Abyssinia, Dar-Fûr.

Lead.—Loango. (Bowdich.)

Chalk.—Dar-Fûr.

Sulphur.—Benguela; Cassandama? Kebrit on the Tripoli coast. (Beechey.)

Coal.—Zumbo. (Bowdich.)

V. THE MAN OF AFRICA. This extensive continent is characterized by certain varieties of the human species, which it will be useful here to distribute into their proper families as accurately as we can, in order to obviate that confusion which is often found in common treatises on geography. We propose merely to give such a general outline of the distribution of the human race in this continent as may show the large masses into which it divides itself: the subdivisions of nations and tribes will be found under other heads. The following sketch is founded chiefly on those *physical* differences, which characterize the animal man in Africa. The reader may see in Balbi's *Abrégé de Géographie*, the classification of the people according to *languages*, of which we will only remark, that we consider it at present impossible to make a classification of African languages without running the risk of almost endless error.

The southern regions of Africa are occupied by two nations, the Hottentots and Caffres. The Hottentots, under different names, were once spread over the territory now called Cape Colony, and at the present day may be considered as generally within its limits, though they have been driven from the southern parts by the European colonists. They occupy, also, the basin of the Orange River. The Hottentot presents some varieties both in physical appearance and moral character; but in his lowest state he is one of the most indolent, helpless, and dirtiest of the human family: his form, though spoken of by some travellers as not positively ugly, would appear from the best accounts to be revolting to our ideas. His hair is black, sometimes brownish, very short, and woolly; his profile is hideous, and remarkable for the prominence of the lips, over which the nose is flattened, displaying the open nostrils; the foot is so singularly formed that he can be tracked by his marks. The colour of the skin is dark brownish, or yellowish, but not black. The Caffres differ both from the Hottentots and those whom we call negroes. The nose approaches to an arched form; yet they have thick lips, and hair curly, but less woolly than the negro. Their colour is a blackish grey; and they are generally well made and of rounded limb. The females are among the handsomest of the black race of Africa. In the useful arts of life, the Caffres are far above their Hottentot neighbours. They extend from Natal, on the southern coast of Africa, into the interior, probably as far as the tropic, but it is not possible to fix their limits with any precision.

The most widely-extended race in Africa is the Negro, which some writers denominate the Ethiopian. The term Ethiopian is indeed often used, but, as it appears to us, rather vaguely, to include all the black-coloured races of Africa. We here understand by it *only* the true negro races, which, whatever resemblance they may bear to the other dark races of Africa, still differ from them considerably in physical character and geographical distribution. Varieties of language, shades of complexion, or other differences certainly subsist among them, (and they are by no means inconsiderable;) but we must still recognize the whole Ethiopian race as forming a distinct and widely spread family. Beginning on the west coast with the Senegal River, which is the southern limit of the arid deserts and the commencement of the fertile regions, we find a race essentially different from those of Northern Africa. In the woolly hair, black skin, the profile of the face and forehead, the oblique insertion of the incisive teeth, the form of the pelvis, and the legs, we see the undoubted characteristics of a race peculiar to the African continent. But it is still difficult to say what parts of Africa must be considered as their proper country, as war and the slave trade have often transplanted the negro from his localities in Africa, just as they have given him a new home in Europe and America, and made his form and character familiar to our every-day experience. We may safely assume, that the negro is on his native soil in all the regions that extend from the Senegal southwards, along the gulf of Guinea, and south of the equator as far as the sixteenth degree of latitude. On the eastern side the negro race hardly extends south of the tropic, for they must not be confounded with the Caffres who dwell from Natal northward. The natives whom Mr. Salt saw as far north as Sofala bay near lat. 20°, he conceived to be nearly allied to the Caffres, whom he also considers to be a race 'perfectly distinct from either that of the Hottentot or of the negro.' We may, therefore, consider the Caffres as stretching nearly as far north as the Zambezi river, where the negroes commence. It is quite impossible to fix the limit between the Caffres and negroes in the interior. The latter may, perhaps, be considered the aboriginal inhabitants of the Mozambique coast, from that coast westwards into the interior: the Mackoua, whom Salt saw at Mozambique, are described by him as the most genuine thick-lipped negroes that he had ever seen; and the expeditions into the interior inform us that the people are negroes, though some of them are described as of a superior appearance and character to those on the coast. This may be attributed to the want of communication with the white man of Europe, who, wherever he has been allowed freely to settle himself, has, for the most part, destroyed or demoralized the people among whom he has come. We cannot at present state how far north on this coast the negro tribes extend, but certainly not beyond Cape Guardafui. The Somaulis of Adel are not negroes.

We know very little of the interior of Africa, south of the points to which Brown, and Denham, and Clapperton advanced; but we may reasonably conjecture these unknown regions to be occupied by black tribes, which indeed is proved to be true, for a considerable distance at least, by the negro slaves whom the traders bring to Dar-Fûr. The cultivable countries which commence south of the Sahara, and are watered by the Joliba and the various tributaries of Lake Tchad, are the region of the negroes, and known among the Arabs by the general name of Sudan or the country of the blacks. But we cannot say how far eastward the proper negro extends. The natives of Dar-Fûr (whose capital Cobbe is in 14° 11′ N. lat., 28° 8′ E. lon.) are described by Brown as having hair generally short and woolly, and a complexion for the most part perfectly black; yet he says they differ in their persons from the negroes of Guinea, and from the black and genuine negro slaves introduced among them by traders from the south and west. The negro races of the Nuba have, however, spread as far north and east as Sennaar, where a negro dynasty of the Fungi (conquerors) established itself in 1504, and has mingled itself with Arab blood, and adopted a Mohammedan creed. The Shangalla, who also belong to the Nuba, have spread eastward as far as the Tacazze and Mareb, and to the coast of the Red Sea. It is, however, not improbable that there were negro tribes on the upper waters of the Nile during the period of the Pharaohs. The negro is easily recognized in the procession in the tombs of the kings at Thebes. (See Belzoni's plates, and Burton's *Excerpta.*)

The desert of the Sahara, and the southern limits that border on Sudan, swarm with innumerable tribes, of whom the greatest number are included under the general name of Moors. They are a mixed race, and live a wandering life; they are not Arabs, but they have adopted the religion of Mohammed. They are found spread toward the regions of Fez and Marocco, towards the arid Atlantic coasts that bound the western Sahara, and their dominion is fixed on the stream of the Mid-Senegal and Mid-Joliba; they form in fact, a narrow belt or slip stretching from the Atlantic along the southern limits of the Sahara into the interior, probably as far as the Bahr el Abiad. The Tibboos are a wandering tribe, who conduct caravans from Fezzan to Bornou, and are considered by some to speak a kind of Berber dialect. But the most numerous and widely-spread race of the deserts are the Tuaricks, who possess the chief trading ports from Ghadamis eastward, through Fezzan, Augila, and Siwah. They are said to speak a Berber language, and to be mixed on the north with Arabs, on the east with Tibboos, and on the west with Berbers.

The mountain regions of the Atlas, which by their position and character hardly belong to the continent of Africa, as well as the whole shores of the Mediterranean from the straits of Gibraltar to the Cyrenaic regions, have been subject to the invasion of conquerors ever since the earliest periods of history. The Phœnician, Greek, and Roman, Vandals and Goths, and Arabs from Asia, have at different periods possessed portions of these regions, and mixed their blood with that of previous races. The Arab invasion has produced the most permanent effects, and that nation now occupies the most fertile parts of the Atlas region and the towns on the coast, and are generally known to us by the incorrect appellation of Moors; the subsequent conquests of the Turks (also an Asiatic race) have done little more than establish a despotic power on a few isolated spots, under a military chief. But it seems not unlikely that, after all these violent revolutions, the Berbers and Shelluhs of the Atlas mountains are the descendants of the primitive inhabitants, and that they retain their original language in all its substantial parts. It has been well remarked by Ritter, that as the Atlas regions differ in character from the rest of Africa, so its primitive inhabitants have a different character also; and, however, their language or usages may have changed during the lapse of many centuries, we can hardly doubt about assigning them to the wide-spread Arabic family, which there is good reason for considering indigenous in northern and north-eastern Africa as well as in the great Arabian Peninsula. The wide diffusion of this race, across the continent as far as the waters of the Nile and the Gulf of Aden, according to some opinions, will be examined more particularly under the head of BERBER, a term applied, we believe, with no great precision, by many writers on African ethnography. We reserve to the particular descriptions of each subdivision of Africa, a short notice of the political revolutions that have affected the physical and moral character of its present inhabitants, or we shall refer for such information to the best authorities. We need only remark, in order to complete this general sketch of man in Africa, that the ruling race of Amhara, and Tigre, who are included under the name of Abyssinians, must either belong to Arabic stock, or, if they be considered as a separate, they are still a nearly related family. But at present we cannot attempt to classify the various peoples who occupy the widely spread Abyssinian provinces; it is probable that they contain many varieties of the human species, the remnants of nations become extinct, or the result of the intermixture of different races. The Galla, whose invasions of Abyssinia from the south may be compared with the movements of the Nomadic tribes of Asia, have not yet been identified with any other nation, and must for the present be considered as a separate family. The Arab race which sometimes has mingled with negro and other races, now occupies a large part of the countries north of Abyssinia as far as the Mediterranean; but the population of the Nile basin is of a very motley character. The Copts, or descendants of the Egyptians, are reduced to a small number; and of all the conquerors or settlers in Egypt, none have stamped their physical and moral character so strongly on the country as the followers of the Prophet. The Arabs have carried their faith as far as Dar-Fûr, and even to the banks of the Tchad; and the Fellatah empire acknowledges the precepts of the Moslem faith. Even in Comassie, the capital of Ashantee, Arabic is taught. The Mohammedan religion has spread over at least one-third of the continent; and some of its precepts and practices seem well adapted to win the favour of the indolent and pleasure-loving negro. When the Portuguese commenced their settlements at Mozambique, they found the Arabs in quiet possession of the coast, and though they succeeded in killing them all, and getting possession of the navigation of the Zambezi river, yet as some of the sovereigns of the interior had at that time adopted Mohammedanism, it is not unlikely that this form of religion exists in these parts of Africa still unknown to us.

The only African countries where Christianity is now established, excepting the few European settlements, are Egypt and Abyssinia. In Egypt it is confined to the Copts, and in Abyssinia both its doctrines and precepts are as ill understood as they are obeyed.

The Arabic is the only character that is now used in Africa by those who wish to read and write, except those employed by the people of Tigre and Amhara. Its use is, however, limited to very few in Sudan, where it is only great doctors who can read and write.

The Jews, a nation now dispersed over almost every part of the world, are found also in the Samen of Abyssinia, in Egypt, and indeed scattered as far west as the kingdom of Marocco. They do not seem to have established themselves south of the Sahara.

The great island of Madagascar, yet so little known, is occupied on the west side by negroes, who have at various times furnished large supplies of slaves to the Cape of Good Hope and the Mauritius. Whether the negro is aboriginal in this island, we do not know. Madagascar at present is to a great extent occupied by a race of Malay stock, whose arrival in the island is not recorded by any historical document. Some Caffres are found on the south coast. Many Arabs also are found in Madagascar, particularly the northern part, of the period of whose arrival there we are entirely ignorant.

VI. ANIMALS OF AFRICA. In the animal kingdom, at least, Africa is as rich in the number of its peculiar species, (if they are not so remarkable for the singularity and anomalous forms which they exhibit,) as any other quarter of the globe. The peculiar difficulties which have at all times opposed the progress of European discovery in this part of the world, have hitherto prevented us from acquiring so satisfactory a knowledge of its zoology as could be wished; but enough is already known to enable us to form a general idea of its productions, and to infer, with a tolerable degree of accuracy, their most prominent features and characters.

Of three hundred different species of mammals which are known to be inhabitants of Africa, upwards of two hundred and fifty are peculiar to that continent and the neighbouring island of Madagascar; and of these a vast majority are to be found only to the south of the great desert. The following table exhibits the relative numbers of the species of African mammals belonging to each of the orders of the Cuvierian system, compared with the whole number of species belonging to the particular order, and it distinguishes those which are peculiar to Africa from those which are common to it and other continents.

ORDERS.	Whole No. of known species.	Whole No. of African species.	No. of species peculiar to Africa.	No. of species common to Africa and other Continents.
I. Quadrumana (Apes, Monkeys and Lemurs) . .	186	55	48	7
II. Cheiroptera (Bats) . .	192	30	26	4
III. Carnivora (Carnivorous Mammals)	320	66	52	14
IV. Rodentia (Gnawing Mammals)	295	48	38	10
V. Edentata (Sloths, Anteaters, &c.)	23	3	3	0
VI. Pachydermata (Hog, Horse, Elephant, &c.) . .	30	15	12	3
VII. Ruminantia (Ruminating Mammals) . .	157	73	63	10
VIII. Cetacea (Whales) . .	76	10	8	2

An inspection of this table will at once show the relative number of species in each order, as well those which are proper to Africa alone, as those which are common to that and the adjoining continents of Europe and Asia. It will be remarked among other things, that Africa is richest in the number of its pachydermatous and ruminating animals, and most deficient in the number of its rodentia and edentata, compared with the whole number of known species belonging to each of these several orders; though it must be observed in regard to the rodentia in particular, that we have at present but a very imperfect knowledge of the African species, as well from their diminutive size and timid character which cause them to be less frequently met with than larger and bolder animals, as from the danger and difficulty which have nearly always attended scientific researches of all descriptions among the Arab and Negro nations. This remark with respect to the great abundance of pachydermatous and ruminating animals in Africa will not be considered devoid of importance, if we reflect that it is principally from these two orders of mammals that the animal food, not only of man, but likewise of the lower tribes of carnivorous animals, is derived. We proceed to give a brief sketch of the most remarkable species of African animals.

The quadrupeds of burden are highly valuable. The Arabian camel (*Camelus dromedarius*) is now spread over all the northern and central parts of the continent, and is indispensably requisite in crossing the long arid deserts which cover so great a portion of its surface north of the equator. Some writers suppose that the camel was not indigenous in Africa, but we have no historical account of its introduction into this continent. It is mentioned in the book of Genesis, as being used by the merchants who traded to Egypt, and of course must have been well known at that period on the banks of the Nile. The head of the camel is found on obelisks and other ancient Egyptian monuments from the city of Alexandria as far south as 18° 25′ of N. latitude. Camels' heads are cut on the plinth of one of the two granite lions which Lord Prudhoe brought from Jebel Barkal in Dongola, in 1832. As to the horse, it is spoken of in the Bible, and is represented on some of the oldest specimens of Egyptian sculpture; but we cannot assert that it is indigenous in Africa, nor on the other hand can we mention any period at which it was introduced. Leo Africanus relates that there are wild horses to be met with in Africa, but this report has not been confirmed by any modern traveller, and there is strong reason to doubt its truth. However this may be, it is certain that the soil and climate of Africa are peculiarly adapted to develope the physical and mental qualities of these quadrupeds. The horses and asses of Barbary, those of the Bedoweens and of Egypt, yield in no respect to the finest Arabs either in beauty of form or spirit. The first of these races was introduced into Spain during the ascendancy of the Moorish power in that country, and from it the noble Spanish breed of modern times is descended.

Of horned cattle there are a great many different varieties in Africa. The most remarkable are the Sanga or Galla oxen of Abyssinia, with immense horns nearly four feet in length, and a kindred race in Bornou, the horns of which measure upwards of two feet in circumference at the base, and yet scarcely weigh two pounds a-piece. Of sheep, the most remarkable varieties are the broad-tailed kind, whose tails grow so fat and heavy that, according to Shaw's report, they are frequently obliged to be supported on little wheel-carriages, as Herodotus says of the Arabian sheep. This variety is common in Barbary, at the Cape of Good Hope, and in other parts of Africa. The edimain, a very tall variety, with long legs, small tails, and drooping ears, is common in Egypt, Sennaar, and Nubia. Both these breeds are covered with short coarse hair instead of wool, and their flesh is very inferior in quality to our European mutton. Goats are in many parts of Africa more common than sheep, as they subsist better on the dry aromatic herbs of the desert, yield a more abundant supply of milk, and are generally preferred for the table. Of these also there are many different varieties; among others, a dwarf species, with short smooth hair and very small horns, which has been introduced into South America, where it has multiplied prodigiously.

The domestic cat is very rare in Africa, but dogs are numerous, and of many different varieties. Among the Mohammedans, it is well known that these animals are considered unclean; but though they refrain from keeping them in their houses, all the large towns of Egypt and Barbary maintain public troops of dogs, which perform the offices of common scavengers, establish themselves in particular quarters of the city, maintain a kind of government among themselves, and are extremely watchful to prevent strangers from intruding into their particular districts. It is no uncommon thing for the wealthy Mussulmans to leave considerable legacies for the support of these animals; and it is very remarkable, that notwithstanding the great heat of the climate, and the constant scarcity of water, an instance of canine madness is never known to occur in Africa.

Domestic poultry are common enough in every part of Africa, though they also are of foreign introduction. Every one has heard of the artificial mode of hatching chickens which has been so long practised by the Egyptians, and of which an exhibition on an extensive scale was some years since afforded to the inhabitants and visiters of this metropolis. Turkeys have, of late years, been introduced about the neighbourhood of Sierra Leone, but they have not yet become numerous, and, perhaps, the country is not well adapted to their habits. It does not appear that the Guinea hen, though indigenous to Africa, is at present domesticated among the inhabitants: in Dar-Fûr, the Guinea fowl is indigenous. Geese and ducks are not extensively distributed, and even where they are found, are reared in small numbers, and held in very slight estimation. Probably, the extreme dryness of the climate may have a considerable influence in depreciating the utility of these birds.

Among the wild animals of Africa the first and most remarkable is the chimpanzee or pongo, the *simia troglodytes* of naturalists. This extraordinary animal, of which there is good reason to believe that more than one variety exists in Africa, approaches much nearer to the human form than the orang outang, or wild man of Borneo Sumatra, and the other large islands of the Indian Archipelago. Its arms are not so disproportionately long as in that animal; its neck is not so short and deformed, nor are its shoulders so high; and it has altogether a much greater facility of standing and walking upright, and of using the anterior extremities as hands, properly speaking. Its organization, however, determines its general habit of walking on all fours; and the hinder extremities are, as in all the order, marked by a thumb—a finger opposed to the other fingers. The adult chimpanzee has never been brought into Europe. Of the inferior tribes of quadrumanous animals, the greater number of the cynocephali, or baboons, are found only among the rocks and mountains of Africa. Many of these, such as the mandril (*Cynocephalus maimon*) and the tartarin (*Cyno. hamadryas*), attain a very considerable stature, and, from their great strength and malicious disposition, are much dreaded by the negroes. The monkeys, properly so called, (*Cercopitheci*,) are likewise an African genus. These playful and harmless little animals, of which there are a great many different varieties, many of them marked with the most brilliant and varied colours, swarm over the whole continent, living in large troops and enlivening the woods with their gambols and chattering. All the various and beautiful species of lemurs also, the tardier and slow lemurs *(nycticebi)* alone excepted, belong either to the continent of Africa or to the neighbouring island of Madagascar. In the latter country, so completely insulated from the rest of the world, and of which the natural productions are, for the most part, singular and anomalous, the different species and varieties of lemurs are extremely numerous, and even entirely replace the apes, baboons, and monkeys of the adjacent continent, none of which, as far as we are at present aware, have ever been found in this island.

The cheiroptera, bats, or winged mammals of Africa, are not so well known as some of the other tribes, though it is probable, from the physical nature of the country and climate, that they are quite as various and abundant here as in Asia and America. Of those which we do know, the most remarkable is the common roussette *(Pteropus vulgaris)*, which inhabits Madagascar and the Isle of France, grows to the size of a small fowl, feeds on fruits, and is eaten by the inhabitants, who compare its flesh to that of the pheasant and partridge.

Carnivorous and ferocious animals are extremely numerous in all parts of Africa. The lion, the panther, and the leopard, lurk in the vicinity of the rivers and fountains to surprise the different species of gazelles and antelopes, but, unless pressed by hunger, rarely attack the inhabitants; though it is said that the lion will often pursue the Hottentot in preference to all other prey. In some parts, however, these animals are so numerous, that the natives will not venture to travel through the woods unless in large parties and well armed. Major Laing informs us, in his journey to the Soolima countries, that he passed through a country which had formerly been well inhabited, but in which, at the period of his visit, there was not a single village to be met with for a space of twenty-five miles along his path, the former populousness of the country being alone indicated by the sites and ruins of several large towns: the inhabitants of these had been forced to remove to other provinces on account of the great numbers and constant attacks of the leopards and panthers. The whole genus of hyænas are, properly speaking, African animals. The common hyæna, indeed, (*Hyæna vulgaris*,) is likewise found in India; but the other two known species (*Hyæna crocuta et villosa*) are found only in the peninsula of Africa. Besides these, there is another animal described by Mr. Burchell, in his *Travels in Southern Africa*, which is intermediate in its habits and organization between the hyæna and the dog, and which has been associated with both these genera under the names of *hyæna venatica* and *canis picta*. All these different species of hyæna live entirely upon offal and carrion, and are of singular importance in the economy of nature, by preventing the accumulation of putrescent matter, and devouring dead carcasses and other garbage, which, under the influence of a tropical sun, would soon corrupt and produce the most noxious and unwholesome vapours. Like feline animals, the hyænas are nocturnal, and nightly visit the towns and villages, where they prowl through the streets till morning, eating the garbage and off-castings of the shambles, and devouring any tame animal which the inhabitants may have neglected to secure. The true civet (*Viverra civetta*) is found in a state of nature in most parts of Africa. Great numbers of these animals are kept by the natives for the sake of their perfume. Nearly allied to the civets are the animals which naturalists call ichneumons (*Herpestes*), of which Africa contains four or five distinct species, and which wage incessant war against the numerous serpents and other reptiles which infest every part of the country. As far as our present information extends, there are no bears in Africa. The older African travellers, indeed, often mention having had their dromedaries and mules bitten by bears during their night encampments, but their relations are always to be understood of the hyæna, which is usually called a bear in the north of Africa, as he is called a wolf in the south.

Of the Rodent mammals (*Rodentia*) of Africa, it has been already observed that we have no very extensive knowledge. Two or three varieties of hares, differing little from our common European species, are found throughout every part of the continent; and the common rabbit, which is now so abundant in all the temperate countries of Europe, is said to have been originally introduced from Barbary. Eight or ten distinct species of jerboas (*Dipus*) inhabit the desert, where they burrow among the loose sand, and feed upon different bulbous roots, which in certain situations are very abundant. Beautifully-variegated squirrels inhabit the woods, and rats and mice, of many different species, are as numerous as in other countries. Among the latter, one species in particular, the Barbary mouse (*Mus Barbarus*), is remarkable for the beauty of its colours, being marked on the back with ten longitudinal white lines; and another (*Arvicola pumilio*), having four black stripes along the back, is thought to be the smallest of all quadrupeds, weighing, according to Professor Sparrman, not more than four scruples.

Though South America is the chief residence of Edentalous mammals, two species are nevertheless found in Africa. These are the aardvark (*Orycteropus Capensis*) and the long-tailed manis (*Manis Africana*). Both feed upon ants, and burrow beneath the surface of the earth; the latter is totally deprived of teeth, but its body is defended in every part by a thick covering of hard, trenchant scales, which protect it, like a coat of mail, from the assaults of its enemies. It has likewise the faculty of rolling itself up into a round ball like a hedgehog; and in this position it is safe even from the teeth and claws of the lion and panther.

The elephant necessarily occupies the first rank among the wild hoofed quadrupeds of Africa. The African elephant, though long confounded with the Asiatic, is now well known to be a distinct species; its forehead is more convex, its ears larger, the markings of its molar teeth are of a different form, and it has only four hoofs on the fore feet and three on the hind, whilst the Indian species has five before and four behind. In magnitude, intelligence, and docility, however, it does not yield to its Asiatic congener; and if we were to credit the exaggerated statements of travellers, it would even appear that the African elephant occasionally attains the height of seventeen or eighteen feet. However this may be, it is at least certain that the tusks of ivory imported from the coast of Guinea are considerably larger than those which are obtained from India—often weighing from one hundred and fifty to one hundred and eighty pounds, whilst the latter rarely exceed one hundred or one hundred and twenty pounds. These animals inhabit all the woody parts of Africa south of the Sahara, and are found in Dar-Fûr: they live in immense herds of from one hundred and fifty to two hundred individuals; and are said to be so numerous throughout the whole extent of middle and southern Africa, that we could scarcely credit the reports of travellers, were they not confirmed by the immense quantities of ivory annually imported into Europe from the western coast of Africa alone. A considerable quantity of this ivory is said to be found in the woods, being either broken by the animals in their combats with one another, or in their attempts to uproot different kinds of trees for the purpose of feeding upon their roots and branches; but much the greater part of it is the produce of the chase, whole tribes often devoting themselves to this employment. Various modes of capturing this huge animal are resorted to by different tribes. Major Laing informs us that the inhabitants of Soolimana attack him in the open field, and kill him with a spear having an iron head, formed like an equilateral triangle, and fired from a long Danish gun. The colonists of the Cape of Good Hope attack this animal, as well as the rhinoceros and hippopotamus, with simple fire-arms, only mixing a little tin with the lead, for the purpose of hardening their balls, and preventing them from flattening against the tough hides of these beasts; and it is no uncommon thing for the expert and experienced hunters to bring down their game at a single shot. Among the Shangalla, Bruce informs us that the elephant is attacked by two men mounted on the same horse, who ride round the beast till the hindmost hunter gets an opportunity of suddenly and secretly dropping down behind him, when, with a single stroke of a sharp double-edged sabre, he severs the tendon Achilles immediately above the heel; and by this means so completely disables him, that the hunters can afterwards despatch him at their leisure. During these hunting expeditions, which often last three or four months, the hunters live entirely upon the flesh of the slain elephants, and frequently collect as much ivory as enables them to live in what they consider affluent circumstances for two or three years afterwards. The African elephant is not now, as far as we know, employed in the service of man; though the Ptolemies undoubtedly obtained elephants of war from Ethiopia. In the sixth century, Cosmas says that the Ethiopians could no longer train them for war [see Adule].

Of the rhinoceros, one species at least, and probably more, inhabits the middle and southern parts of Africa, frequenting the same localities as the elephant, and hunted as ardently by the people, though his hide and horns are the only part of him that can be turned to account. Of this shields are made in some parts, and in others traces and harness; for all of which purposes its great thickness and durability render it extremely appropriate. The African rhinoceros, like that of Sumatra, has two horns, but it is distinguished from the latter species by having no front or incisor teeth. The horns, as in the East, are highly esteemed for their supposed medicinal virtues.

The hippopotamus is found in the large rivers and lakes of Africa south of the Great Desert; and from being less hunted and more difficult to come at than either the elephant or rhinoceros, is in many parts extremely common. This animal appears to have kept possession of the fresh-water lakes and rivers of Africa, and to have inhabited the very same localities which he now occupies from the earliest ages. The Greek and Roman writers frequently mention him as an inhabitant of the Nile; and Hanno, the Carthaginian Admiral, in his voyage along the western coast of Africa, informs us that he came to a large river—which, it is supposed, must have been either the Senegal or the Gambia, or the Rio Grande—in which the hippopotami were very numerous. At the present day the hippopotamus is never seen below the second, and perhaps not below the third cataract of the Nile; but on the opposite coasts of the continent, in the Senegal, the Gambia, and the Niger, they are numerous, and extend southward as far as the Cape. Within the boundaries of the latter colony, indeed, this animal is at the present day rarely met with; but it was formerly as abundant as in other parts of Africa, and still exists on the northern and eastern frontiers.

The engallo or wild boar of Africa (*Phascochœros*) is a very different species from that of Europe, though the latter is likewise said to be found in Egypt and Barbary, as it certainly is in India and other parts of the East. The engallo is, perhaps, the most hideous of all mammals in appearance. It resembles the elephant in the form and structure of its molar teeth. Of these there are never more than two in each jaw; they are not renewed as in ordinary quadrupeds by the new one growing under the old, and gradually pushing it out of the socket; but the young tooth is formed in this case behind the old one, and gradually advances forward and assumes its situation, as the latter is worn down by constant use.

The zebra, the dow, and the quagga (*Equus Zebra, duplivirgatus, and quaccha*) are found in most parts of southern and central Africa which are known. These beautiful animals, equally remarkable for the symmetry of their forms, the rapidity of their course, and the brilliancy and wonderful regularity of their colours and markings, associate in large herds upon the open plains and gentle declivities, and are the frequent prey of the lion, which is said to prefer their flesh to the dry and tough venison of the various species of gazelles and antelopes that inhabit the same localities. It has been repeatedly remarked by African travellers, that these animals and the ostriches seem to have a natural predilection for each other's society, and that the flocks and herds of these very different species are constantly found intermixed, though they refuse to associate with other animals. It is not a little remarkable, that the same was observed by Xenophon, during the expedition of the ten thousand Greeks, with respect to the ostrich and quagga or wild ass, on the plains of Syria and Mesopotamia. The fact may probably be accounted for by the mutual security which each feels in the other's company, the long and flexible neck of the ostrich enabling it to take notice of the most distant appearance of danger, and the well-known courage of the wild ass compelling beasts of prey to respect their quarters. It is to be lamented that no judicious attempts have ever been made to domesticate these beautiful animals.

Among ruminating animals, Africa is chiefly remarkable for the immense numbers of different species of antelopes which it contains; no fewer than sixty species, out of eighty which have been enumerated in this extensive genus, being proper to that continent. This is a very peculiar feature in the zoological character of Africa, especially when we consider that there have been only two species of deer (one of which is our common fallow deer, which has been ascertained to be indigenous to North Africa) hitherto discovered throughout the whole extent of the continent. Asia, on the contrary, whilst it abounds in many different species of deer, contains, comparatively, very few antelopes, being thus completely opposed, in an important zoological feature, to the neighbouring continent. For a more detailed account of the habits and external characters of these animals, see *Antelope*. Of other wild ruminating animals indigenous to Africa, the most remarkable is the giraffe or camelopard, which is found from the banks of the Gariep to the southern borders of the Great Desert. Two or three wild species of buffalo also inhabit the woods and marshy grounds of the interior, but we know little of their forms or habits. The bos caffer, or wild buffalo of the Cape, has the base of the horns extending all over the top of the head and forehead, in the manner of a helmet; he is a savage, dangerous animal, and much dreaded by travellers.

Among the cetaceous mammals which inhabit the seas and coasts of Africa, we need only mention the lamantin, (*manatus Senegalensis*,) which frequents the mouths of the great rivers on the Atlantic and Indian Ocean, and feeds upon the aquatic plants that it can reach along the shores. It was this animal which, from the pectoral situation of its mammæ, and from the habit of raising itself half out of the water, especially when in the act of suckling its young, gave origin to the fable of the mermaid, by which name it is often mentioned by ancient African voyagers and travellers.

Of the ornithology of Africa, we cannot undertake to give more than a very general account. Indeed, from the physical conformation of birds, they are not so confined and limited in their geographical distribution as quadrupeds; and, consequently, the ornithology of particular countries is never so peculiar nor exclusive as its mammalogy. Birds, possessing powers of locomotion which quadrupeds want, often migrate to the most distant climates. Thus many of our European species, such as the common quail, the land-rail, the cuckoo, and the different varieties of swallows which spend the summer and autumn in northern climates, migrate for the winter season to Africa; and others of our common species are found distributed over the whole eastern hemisphere without presenting any sensible difference, even in the colour of a feather, in the most remote localities. The ostrich has already been incidentally mentioned as an inhabitant of Africa. At the present day, indeed, it would appear to be exclusively confined to that continent, though in the age of Aristotle and Xenophon it was found in the deserts of Syria and Mesopotamia. Captain Lyon informed us that the best ostrich feathers imported from Barbary are not procured from the wild birds of the desert, but from semi-domesticated individuals which the Arabs take young and breed up in stables, where they are well supplied with soft bedding to prevent them from wearing or injuring the feathers. Similar to the ostrich in many of their habits, and even somewhat in appearance, are the bustards, many different species of which inhabit the Karroos and arid plains of Africa. Of gallinaceous fowls, adapted to the poultry-yard, Africa possesses but a single genus, the Guinea-hens, (*numida*,) which, however, are found in no other part of the world. These birds, of which there are three or four distinct species, go in large flocks of 400 or 500, and are most frequently found among underwood in the vicinity of ponds and rivers. There are, besides, many species of partridges and grouse in different parts of Africa; but as these are not fitted for domestic purposes, and have otherwise nothing remarkable in their habits or economy, it will be sufficient at present to indicate them thus generally. Wild fowl of various species are also abundant on the lakes and rivers, as are likewise various species of owls, falcons, and vultures, the latter of which, like the hyænas among the quadrupeds, are highly useful in consuming the offal and carrion which might otherwise taint the air and produce disease. The exquisite sense of smell possessed by these birds is truly surprising. One of the most remarkable and useful birds of prey peculiar to Africa is the secretary (*serpentarius*), which may be not improperly described as an eagle mounted on the long naked legs of a crane. This bird preys exclusively upon serpents, which it pursues on foot, and destroys in amazing numbers.

Among the smaller birds of Africa are many species remarkable for the gaudiness and brilliancy of their plumage, or the singularity of their manners and economy. Of the former kind may be mentioned the innumerable varieties of parrots and parroquets, which, from the size of a sparrow upwards to that of a raven, swarm in all the forests, and make the woods resound with their hoarse unmusical screams. Of the latter kind, it will be sufficient to mention the honey cuckoo (*cuculus indicator, Lin.*) and the little bird called the republican (*loxia socia, Lath*).

Lizards, serpents, and other reptiles abound in every part of Africa. The crocodile inhabits all the large rivers of the tropical parts, and is still abundant in the Nile below the first cataract; different species of chameleons may be seen on every hedge or shrub; and the enormous python, a serpent of thirty feet long, lurks in the fens and morasses. Among the venomous species, the dipsas, the asp, and the cerastes, or horned viper, are frequently mentioned by the ancient classical writers; whilst the garter snake, the puff adder, and other species, are at present employed to poison their arrows by the Bosjesmans, the only African tribe who use this deadly and cowardly weapon.

Of the insect tribes, Africa also contains many thousand different kinds. The locust has been from time immemorial the proverbial scourge of the whole continent; scorpions, scarcely less to be dreaded than the noxious serpents, are everywhere abundant; and the zebub or fly, one of the instruments employed by the Almighty to punish the Egyptians of old, is still the plague of the low and cultivated districts. For a particular account of the ravages of this dreadful insect, the reader is referred to Bruce's *Travels*, (4to. edit.) vol. i. p. 388, and *Appendix*, p. 188, where there is also a good figure.

VII. PLANTS OF AFRICA. The nature of African vegetation will be best understood by tracing geographically the changes it undergoes between a state but little different from that of the south of Europe, and the singular Flora of the Cape of Good Hope. To the traveller who passes from the south of Europe to Tangier, the appearance of the African coast presents nothing remarkably different from what he has left in Europe; and along the whole of the most northern shores so great a similarity continues to be preserved, that if it were not for a few striking objects, he might fancy himself still in Spain or in France. Groves of oranges and of olives; wide plains covered with wheat and barley; thick woods of evergreen oaks, cork trees, and sea pines *(Pinus maritima)*, intermixed with cypresses, myrtles, arbutus, and fragrant tree heaths *(Erica arborea)*, form the principal features of the landscape; while the plains are covered with the gum cistus, and the hills and rocks with odoriferous rock-roses, palmetto trees, and the wild caper. In January and the early months of the year, when the climate is like that of the warm days of our spring, the plains are green with grass, and embellished with innumerable little flowers of the monocotyledonous class, and the gardens are gay with the blossoms of the almond, the apricot, and the peach. Even in the summer season, when all the more delicate plants have been dried up beneath a scorching sun, there is still the oleander, with its brilliant bunches of rosy flowers, by which are traced from afar the courses of the rivers on the banks of which it loves to dwell, and those humid spots which, from accidental circumstances, being never dried up, are then a kind of vegetable oases. On this northern coast the date palm is first found; but its fruit does not arrive at perfection, and it is chiefly valued as an object of ornament to gardens and houses.

The principal objects of cultivation in the Barbary States are a kind of wheat, *(Triticum durum,)* the stems of which are solid, and the grain horny rather than farinaceous; barley which the Moors give their horses instead of oats, maize, caffre corn, *(Holcus sorghum,)* rice, tobacco, olives, oranges, and figs of the most delicious quality; pomegranates, grapes, and jujubes, together with sweet melons and water melons. They also grow the white mulberry for silkworms, a kind of indigo, *(Indigofera glauca,)* cotton, sugar-cane, and most European esculent vegetables. It is in the mountainous country, south of the Barbary States, in the chain of Atlas, that grows that famous timber *(Thuja articulata)* called, from the substance it produces, the sandarach tree, which is almost imperishable, from which the ceilings of the mosques are exclusively constructed, and which is supposed to have been the shittim wood of Scripture.

As soon as the chain of Atlas is passed, the scene begins to change; the excessive dryness of the climate on the northern borders of the Great Desert is such, that few trees, except the date, can maintain an existence. It is, however, in this arid region, where rain seldom falls, where wheat refuses to grow, and even maize, barley, and caffre corn, afford the husbandman a miserable and uncertain crop—where the blasts from the south are scarcely supportable by the native himself, that this invaluable gift of Providence finds its fitting station. It is here that the groves of date palms form a screen impervious to the rays of the sun, and cherish beneath their shade, the orange, the lemon, the pomegranate, and the vine, the latter of which climbs to the summit of their trunks by means of its twisted tendrils. Although reared in constant shade, all these fruits acquire a more delicious flavour than in what would seem a more favourable climate.

Egypt exhibits a scene intermediate, as it were, between the first and the last of these descriptions; but also presenting more the appearance of a tropical country. European plants begin to disappear; in the districts still watered by the Nile, we find all the richness of vegetation of the spring months of Barbary; abundance of rice, barley, and wheat; rich fields of sugar-canes; olives, figs, vines, and plantains that have been introduced; while in the hotter or drier, or more southern, the date is the chief object of the scenery. Nothing but stunted and miserable looking bushes are able in the open plains to contend with the accumulating sand for the possession of the soil. In the richer parts of the country we find the acacias which produce gum arabic, large tamarisk trees, called atlé, great quantities of the senna plant *(Cassia obtusifolia* and other species), intermixed with various herbs belonging to tropical genera, all of which are either unknown or very rare in the more northern parts of Africa. Cotton, coffee, indigo, and tobacco are cultivated with the greatest success. At Thebes first begins to appear a third race of palms different from the date and the palmetto; viz., the forky-branched doom palm *(Cucifera Thebaica)* of Upper Egypt, which is most remarkable as being almost the only species in the whole palm tribe in which the stem is not perfectly simple and unbranched; and in Abyssinia are first found species of the ginger tribe (*Scitamineæ*), in the form of cardamoms, which afterwards become a feature of African vegetation within the tropics.

The deserts that occupy the interior of this continent, like inland oceans of sand, are scarcely inhabited by any plants except of the most stunted character; one of the most remarkable is a grass called kasheia *(Pennisetum dichotomum)*, which wholly covers immense districts, and is said to cause intolerable annoyance to the traveller by its prickly involucrum; another is the agoul *(Alhagi maurosum)*, which furnishes a grateful food for the camel.

In the equinoctial parts of Africa all trees of European vegetation, and even the date tree itself, disappear; where moisture exists in sufficient abundance to favour vegetation, the flora partakes in a certain degree, particularly on the east side, of the plants of India, but is to a much greater extent composed of species peculiar to itself. The landscape is characterized by masses of the unwieldy Baobab (*Adansonia*), the fruit of which affords the natives a grateful drink, huge cotton trees (*Bombax pentandrum*), the trunks of which project at the base into great buttresses, shrubs of richest verdure, large gramineous plants with branching stems, impenetrable thickets extending into the water, with thick groups of oil palms (*Elais Guineensis*), sago palms (*Sagus raphia*), and others of the same majestic tribe. In the thickets numbers of combreta, of bindweeds, and of other climbers twine among the branches of the trees, which they adorn with flowers of white, or scarlet, or orange. On the branches of the forest trees grow sparingly various genera of epiphytes; the laburnum of the colonists (*Cathartocarpus fistula*) expands its branches of golden flowers, and replaces the senna of Alexandria; in some places the woods abound in pine-apples, which, although not natives of the continent, have established themselves as completely as in their native stations in tropical America; the plains are often covered with immense quantities of the papyrus plant, to the exclusion of all others; and in the regions near the line a new feature is introduced by the chandelier tree (*Pandanus candelabrum*), which rises singly in the plains, and divides its grotesque branches into repeated forks, the extremities of which are crowned with long, rigid, channelled leaves, like those of the pine-apple.

With the general nature of the vegetation change also the species that are cultivated for the food of man. In the tropical regions of Africa, no waving fields of corn reward the labours of the husbandman; the vine is unknown, the figs are of other and of useless species, and of all the northern fruits the orange and the lime alone remain. In their stead the cassava (*Iatropha manihot*), the yam (*Dioscorea*), the pigeon pea (*Cytisus cajan*), and the ground-nut (*Arachis hypogæa*) are the farinaceous plants; the papaw (*Carica papaya*), the tamarind, and the nitta or doura tree (*Parkia Africana*), are the fruits in some places; the Senegal custard apple (*Anona Senegalensis*), the grey plum (*Parinarium*), and the Safu, in others; and the bread fruit of Polynesia is represented by a large tree called musanga, the seeds of which are as agreeable as hazelnuts. Besides these, we have in Sierra Leone and along the same coast, the remarkable cream fruit, which, although of a most poisonous family, yields a wholesome and pleasant saccharine juice; the water-vine (*Tetracera potatoria*), the stems of which are a sort of vegetable fountain, discharging, when cut across, a cool, limpid, and refreshing fluid; the negro peach (*Sarcocephalus Africanus*), a brown succulent fruit, said to taste like a strawberry; the monkey apple (*Anisophyllea laurina*), the drupe of which is, in flavour and size, between a nectarine and a plum; and various species of pigeon plums (*Chrysobalanus*), together with the mammee apple (*Mammea Africana*), pishamins (*Carpodinus*), and star-apples (*Chrysophyllum obovatum*).

As we approach the southern point of this continent, a new change passes over the face of nature; tropical forms disappear as they have formerly appeared, and we lose the scenery of the cotton tree, the baobab, the palm, and the chandelier tree; not however to find their places occupied by the plants of Barbary and the north, but to contemplate an order of vegetable beings so different, that their very genera had been previously unseen: still the same wilderness of sand and drought occupies the centre of the country, but it is no longer covered with prickly grasses or waving thickets of papyrus. The karroos of the Cape Colony are the residence of fleshy, leafless, distorted, shapeless tribes of Stapelias, of Mesembryanthemums, Euphorbias, Crassulas, Aloes, and other succulent plants, each holding to the soil by the weak support of a single, wiry root, and feeding rather upon the dews of heaven than the moisture of the soil,—a situation to which they are admirably adapted by the want or imperfect state of their evaporating pores, so that whatever humidity they are able to collect is parted with as slowly as the limited supply is furnished to them. Among these grow stunted bushes of endless species of heath (*Erica*), and succulent geraniums (*Pelargonium*), strong-scented Bucku plants (*Diosma*), and a great variety of shrubby *Compositæ*. The hills and rocks are scattered over with a remarkable tribe of plants called Cycadeæ, intermediate, as it were, between ferns and palms; the plains are permanently clothed with patches of a rush-like plant called *Restio;* while the whole country, after the rains, teems with the fugitive but lovely blossoms of the *Ixia*, the *Gladiolus*, the *Disa*, the *Satyrium*, and the *Oxalis*. Plants of the Protea tribe also, of which there are very many species, for the first time appear since the country of Abyssinia, and under the name of Witteboom (*Protea argentea*) supply the inhabitants of Cape Town with fuel.

At Cape Town itself has been introduced the American aloe, which, with its spiny rigid leaves of six feet in length, forms impenetrable hedges, more resembling chevaux-de-frise than any living barrier; and the oaks and stone-pines of Europe have found a congenial climate.

Such are the more prominent features of the vegetation of Africa. Its islands partake more or less of the nature of the flora of the adjacent continent, modified chiefly on the west side by the cooling breezes of the Atlantic, and on the east by the wide expanse of the Indian and southern oceans. In these spots we have usually a total absence of African sterility, in consequence of their insular position; and from their luxuriant vegetation we may judge what that of Africa would be if either nature or the skill of man could succeed in conducting rivers and streams where there are now only barrenness and drought.

VIII. The following view of the great divisions of Africa, according to our present incomplete knowledge, will show under what particular heads further information will be found. This division is one of convenience, and may be liable to objections, but it is impossible to attempt, in a limited space, any complete division of Africa.

1. The region from the Orange river southwards, comprehending the CAPE COLONY, its mountains, elevated plains, European settlements, and native population; and extending eastward to the Great Fish River.

2. The eastern coast of Africa, from the Great Fish River to the neighbourhood of the Portuguese settlements, near Da Lagoa bay; comprehending the sea-coast occupied by the CAFFRES, or NATAL. In the interior the Caffre race is widely diffused in the high table-land, and has been found also, occasionally, on the coast as far as Quiloa.

3. From Da Lagoa bay to Cape Guardafui, the northern part of which coast is very little known; comprehending SOFALA, the settlements on the ZAMBEZI river, MOZAMBIQUE, and the native tribes of the coast and the interior, as far as they are known. From the neighbourhood of Cape Delgado north, we find the names of ZANGUEBAR and AJAN; the last-named coast terminating at the great eastern cape.

4. The ABYSSINIAN countries, with which may be grouped the almost unknown regions that border on them to the south; with the Galla, the Somaulis, Danakil, and other tribes, as far north as Masuah on the Red Sea [see ADEL].

5. The country of the BAHR-EL-ABIAD, or great western branch of the Nile, and the countries north of Abyssinia, comprehending the Nile Valley and the eastern deserts, between the Nile and the Red Sea. DARFUR and KORDOFAN may be most conveniently arranged in this division. Darfur is connected by some geographers with eastern Soudan. SENNAAR, DONGOLA, NUBIA, and EGYPT, belong to this division. The term NUBIA, since the conquests of Mohammed Ali, is sometimes used as a general name to comprehend all the countries south of the first Nile cataracts, which are subject to the Pacha. The BEJAS, BISHAREEN, ABABDES, and other tribes belong to this division.

6. The region west of Egypt, known to the Arabs by the general name of Maghreb, or the *West*, and extending to the extremity of the Atlas chain, comprehends the great political divisions of TRIPOLI, including BARCA, TUNIS, ALGIERS, and MAROCCO. This extensive region is often included by Europeans in the general term of BARBARY.

The chief OASES westward from Fezzan may be classed under this head, and placed in the division of BELAD-EL-JERID, or *Land of Dates*, according to some interpretations.

7. The SAHARA, or the great desert; with some of the oases.

8. SOUDAN or Central NIGRITIA, comprehending the regions watered by the Quorra and its tributaries, and by the tributaries to the Lake Tchad.

9. As a subdivision of No. 8, we may reckon the coast from the Senegal to the outlets and delta of the Quorra, including the countries watered by the Senegal, Gambia, Rio Grande, &c. &c., and the coast of Guinea, with the states in the interior. A name is wanting for this division: we shall use that of Western NIGRITIA, under which the subdivisions of this region, as far as they are known, will be given. The term of Senegambia was once in use, to signify the country from the Senegal to the neighbourhood of Sierra Leone.

10. The region from the Bight of Biafra to Cape Negro, which may be named Southern NIGRITIA, comprehending a long line of coast little known, and an interior still less explored. The names of LOANGO, CONGO, ANGOLA, and BENGUELA, are the chief great divisions hitherto adopted by those who have described this region.

These divisions of NIGRITIA, which are here adopted for the sake of convenience, are those of Balbi in his *Abrégé de Géographie*, except that he makes a fresh division of the Guinea coast, which comprehends the two great states of

Ashantee, Dahomey, &c., and calls it by the name of Maritime-Nigritia.

The African islands, not immediately bordering on the coast, consist of the following chief groups, or single islands.

North Atlantic Ocean.

The Madeiras—Archipelago of the Canaries—the ten Cape Verde Islands—Islands in the Bight of Biafra; Fernando Po, Prince's Island, St. Thomas, Anno Bom, &c. —The nine Azores, or Western Islands, are considered by some geographers as belonging to Africa.

South Atlantic Ocean.

St. Matthew—Ascension—St. Helena.—The three small islands of Tristan d'Acunha.

The South Indian Ocean.

Madagascar, which may be considered as the centre of an Archipelago of small islands, to which belong the Mauritius and Bourbon, the Comoro Islands in the Mozambique channel, the Sechelles, with the Amirantes; and the islands on the coast of Zanguebar.

The North Indian Ocean.

The islands of Socotra, off Cape Guardafui. The islands of the Red Sea are generally small and inconsiderable, and partake of the character of the Arabian and African coasts, to which they may be respectively assigned according to their degree of proximity.

European Possessions in Africa.

Portuguese.—The government of the Madeiras—of the Cape Verde Islands; and the small posts of Cacheu on the San Domingo, Bissao, Zinghicor, Farim and Geba—of St. Thomas, and Prince's Island—the post of Whidah in Dahomey—the captaincy or government of Congo and Angola, consisting mainly of a few towns and posts—the Mozambique government, on the coasts of Sofala and Mozambique, extending from the bay of Da Lagoa to Cape Delgado: it is divided into seven captaincies, but the real possessions of the Portuguese are now few and insecure; the chief are, the little island of Mozambique, and the settlements of Quilimané, Senna, Tette, Manica, on the Zambezi river. Melinda, once a flourishing Portuguese settlement on the Zanguebar coast, is now deserted by that nation.

English.—Bathurst, on a small isle at the outlet of the Gambia, and a few posts dependent upon it—the establishment of Sierra Leone—the establishments on the Gold and Slave Coast, all, except one, within the Ashantee territory. Cape-Coast is the chief position: the rest are of little importance—the islands of Fernando Po, occupied in 1828, Ascension, St. Helena, and the islands of Tristan d'Acunha—the colony of the Cape of Good Hope—the Mauritius, and a number of small islands belonging to the Madagascar Archipelago.

French.—The state of Algiers on the northern coast of Africa, conquered by the French in 1830—on the Senegal and Gambia coast, the district of St. Louis, and that of Goree—the isle of Bourbon, and St. Marie, near Madagascar, with a few posts on the latter island.

Spanish.—The *Presidios*, near the straits of Gibraltar in the empire of Marocco, which contain the towns of Ceuta, Melilla, &c.—the Archipelago of the Canaries, consisting of seven larger and about thirteen smaller islands.

Dutch.—The only Dutch possessions now in Africa are some posts or forts on the Gold Coast, and chiefly within the limits of the Ashantee empire: the principal place is Elmina, the residence of the governor-general.

Danish.—These are a few unimportant posts, also on the Gold and Slave Coasts, and within the Ashantee dominion. Christiansburg is the chief place, and the residence of the governor-general. Only *one* vessel went from Denmark to these settlements in 1830, and this after a lapse of several years.

American.—The colony of Liberia near Cape Mesurado, founded by the American Colonization Society. It is a private enterprise, and has for its object the settlement in Africa of free negroes from the United States. The chief places are Monrovia and Caldwell.

Ottoman.—These are really foreign possessions, being held by Turkish authorities, who are nominally dependent on the Sultan of Constantinople. They are Egypt, the eastern desert, the Wadys of Siwah, Khargeh, &c., Nubia, Sennaar, Kordofan, &c. Tripoli and Tunis can be no longer considered as at all dependent on the Sultan.

AFRICAN ASSOCIATION. A society formed in London, in the year 1788, with the design of encouraging men of enterprise to explore the interior of Africa; of acquiring by their means a knowledge of the character of the native inhabitants; and of being enabled to introduce among them the arts of civilization.

At its first formation, the Association consisted of ninety-five members, many of whom were men distinguished by their zeal in the cause of science. The management was intrusted to a committee of five persons elected from among the members. This committee administered the funds, conducted the correspondence, and appointed the persons to whom the accomplishment of its objects was confided. Sir Joseph Banks was one of the first and most efficient members of this committee.

The first person commissioned by the Association was John Ledyard, an American, who had already gone round the world with Captain Cook, and had given other proofs of his adventurous disposition. The task assigned to him was that of traversing the widest part of the continent of Africa, from east to west, in the supposed latitude of the river Niger. While preparing himself for this undertaking, and making the necessary inquiries at Cairo, where he had arrived in August, 1788, Mr. Ledyard was seized with a bilious fever and died.

The committee lost no time in supplying his place; and in October of the same year despatched Mr. Lucas, whom they selected on account of the knowledge which he had acquired in previous travels of the language and customs of the Arabs. The instructions of the committee to Mr. Lucas were, to proceed from Tripoli over the great desert of Sahara, and to return homeward by the way of the Gambia or the coast of Guinea. To fulfil these instructions Mr. Lucas proceeded from Tripoli to Mesurata, where he remained about a month collecting information, when, owing to the difficulties and dangers, caused by a state of warfare, which constantly opposed themselves to his undertaking, he was induced to retrace his steps to Tripoli, and thence returned soon after to England.

The next person engaged by the Association was Major Houghton, an officer who had acquainted himself, in the course of former journeys, with the customs of the Moors and Negroes. He arrived at the mouth of the river Gambia in November, 1790, and ascended the stream to Medina, the capital of the kingdom of Woolli, on the north side of the river. He next crossed the river Faleme, and arrived at Ferbanna, sixty-five miles S.E. of Bambouk. Endeavouring thence to penetrate the kingdom of Ludamar, Major Houghton engaged with some Moorish traders at Jarra to accompany them to Tisheet, but was treacherously plundered by them and left in the desert. After severe privation, he returned to Jarra, and there died, in September, 1791, not without strong suspicions of having been murdered.

Without being discouraged by these repeated disappointments, the Association sought for some other person to prosecute their plans, and were fortunate in meeting with Mungo Park, who sailed in May, 1795, and arrived at Jillifree, on the banks of the Gambia, and near to its mouth, in the kingdom of Barra. In December he set out from Pisania, accompanied by two negro servants and four other natives, and advanced into the kingdom of Woolli. He then went through Kajaaga, crossed the river Senegal, and proceeded through the kingdoms of Kaarta and Ludamar to Jarra. Mr. Park afterwards successfully explored the banks of the river Niger, here called the Joliba, which till then had been thought identical with the Senegal,—proceeding as far as the populous city of Sego, the capital of Bambarra, and to Silla. This last place (in lat. 14° 48′ N., long. 1° 34′ W.) was the extreme limit of his first journey, the particulars of which were communicated to the Association in 1798. The second journey of this adventurous traveller in 1804 was undertaken at the expense of Government.

In July, 1797, Mr. Hornemann, a German, left London under an engagement with the Association. This gentleman had previously endeavoured, by much study, to qualify himself for the task of exploring Africa, and with the same object remained some time at Cairo. Here, while waiting the departure of the caravan to Cassina, Mr. Hornemann was seized, together with other Europeans, but was released by order of General Buonaparte, who, on learning his destination, supplied him with passports and other facilities for his journey. He commenced his travels westward with the caravan in September, 1798, and arrived at Moorzouk, in Fezzan, in November. Here he remained for a considerable time; and in April, 1800, set out for Bornou. His last despatches were previously sent off by way of Tripoli, and expressed the confident hope of being able to penetrate farther to the southward and westward than any preceding European traveller. From that time no certain intelligence of his fate was ever heard. Vague rumours, received eight years afterwards, stated the probability of his being still alive in the interior of the country. According to one report, he was living, in June, 1803, in Cashna, where he had assumed the character of a Marabout or Mussulman saint, and was highly respected.

Mr. Nicholls was next engaged by the Association. This gentleman, who was instructed to proceed to Calabar, in the Gulf of Benin, arrived there in November, 1804, and died shortly after from the fever of the country.

A young German, named Roentzen, recommended to the Association by Professor Blumenbach, was next despatched to Africa. To fit himself completely for the journey, he acquired a competent knowledge of the Arabic language, put off his European dress, and assumed the character of a Mussulman. Great part of the year 1809 was spent by him at Magadore, that he might perfect himself in the part he was to act: he then set out, with two guides, to join the caravan proceeding to Soudan, but before he could accomplish this object, he was barbarously murdered,—a deed to which his guides were most probably incited that they might possess themselves of his property.

The last missionary of the Association was John Lewis Burckhardt, a young Swiss of good family, who visited England in 1806, and in 1808 offered his services to proceed to Africa. Between this time and March, 1809, when he sailed for Aleppo, Mr. Burckhardt remained at Cambridge studying Arabic. On his arrival at Aleppo he assumed the name of Ibrahim Ibn Abdallah, together with the eastern costume, and all the outward characteristics of a Mussulman. He remained in Syria two years and a half, which time was spent in acquiring a knowledge of all the spoken dialects of the country, and in habituating himself to the customs of the people. At the expiration of this time he set off for Nubia, crossed the Red Sea, and after visiting Mecca and Medina, arrived at Cairo in June, 1815. In the following spring he visited Mount Sinai, and returned to Cairo, where he remained until October, 1817, when he was seized with dysentery and died. The journal of his travels in Syria to the time of his arrival in Cairo was transmitted to the Association, and published. His papers of a later date, which are believed to have been highly interesting, have not hitherto reached this country, and it is feared are lost.

These repeated failures appear at length to have discouraged the Association from engaging other missionaries. A great deal of information, connected with the geography of Africa, was collected by them from various sources during the period of their active labours; and this information was communicated to the public in the occasional printed reports of their proceedings.

The Association has recently merged in the Royal Geographical Society, into which body its few remaining members were admitted in 1831. [See *Proceedings of the Association*, from 1794 to 1805; Leyden's *History of Voyages and Discoveries in Africa*, edited by H. Murray; and *Journal of the London Geog. Soc.* vol. i. p. 257.]

AFRICAN COMPANY. A regulated Company established by the act 23 Geo. II. cap. 31, (1754,) which was first charged with the maintenance of all the British forts that lie between Cape Blanco in lat. 20° 47′ N., long. 16° 58′ W. and the Cape of Good Hope, and afterwards with upholding those only which lie between Cape Rouge and the Cape of Good Hope. Previously to its incorporation, four other joint-stock companies had been successively established for prosecuting the African trade. The last of these, the Royal African Company, had an exclusive privilege by charter, under which it carried on a losing trade of conveying negroes to the plantations, and of importing gold-dust, elephants' teeth, and dyeing drugs from the inland parts of Africa. By the act which established the African Company this exclusive charter was recalled, and their forts and garrisons were vested in the regulated company. The fine which entitled any merchant to be admitted a member of this corporation was limited to forty shillings. The Company was prohibited from trading in its corporate capacity, or upon a joint stock; from borrowing money, or from laying any restraints upon the trade, which might be carried on freely from all places and by all persons, being British subjects, who should pay the fine. The government was vested in a committee of nine persons, who were elected annually by the freemen of the Company resident in London, Bristol, and Liverpool; three members being returned from each of the places, who held their sittings in London.

For the purpose of maintaining the forts and garrisons, an annual sum of about 13,000*l.* was voted by Parliament, for the due disposal of which the committee were responsible to Government. The salaries of their clerks and agents, with all other expenses of management, including compensation to the members of the committee for their trouble, were allowed out of the sums received as fines of admission from the freemen. In the course of time it happened that the whole expense of the Company came to be defrayed by the public, and for this reason the charter of its incorporation was recalled by Parliament in 1821 (1 and 2 Geo. IV. cap. 28); his Majesty being empowered to grant allowances to the officers and servants of the Company. The possessions of the Company on the west coast of Africa were by this act annexed to and made dependencies upon the colony of Sierra Leone.

AFRICAN INSTITUTION. A society established in London, in April, 1807, whose declared objects were, to collect accurate information respecting the natural productions, as well as the agricultural and commercial capabilities of the African continent, and, also, respecting the condition, intellectual, moral, and political, of its inhabitants: to cultivate friendly relations with the African people, and to promote among them the diffusion of useful knowledge:—to introduce among them the arts of civilization; to promote the pursuit of agriculture, furnishing for that purpose seeds and plants, and implements of husbandry. Another object announced by the promoters of the institution, was that of introducing useful medical discoveries among the inhabitants—an object of the highest benefit when the nature of the climate is considered. In order to accomplish these aims, the institution proposed to employ suitable agents, to establish correspondences, and to reward the exertions of individuals in promoting its purposes. It was another principal object to obtain a knowledge of the African languages most extensively used, and to reduce them to writing, with the view of facilitating the spread of information among the natives. As an important instrument for promoting these objects, the members of the institution were invited to devote their individual attention and united influence to obtain the enforcement of the law, then recently passed, for abolishing the African slave trade, and to expose all attempts to evade its provisions.

Among the early patrons of these laudable objects, were to be found many of those members of both Houses of Parliament whose exertions had procured the passing of the abolition law.

The institution disclaimed all projects of a colonising or commercial nature, and did not profess the intention of imparting religious instruction to the African people.

To provide the funds required for the prosecution of its plans, four classes of contributors were invited to associate themselves; viz., hereditary governors, whose qualification was a donation of sixty guineas and upwards; life governors, whose donations amounted to thirty guineas; governors, who subscribed annually three guineas and upwards; and members, who contributed each one guinea a-year. The affairs of the institution were to be administered by a patron, president, twenty vice-presidents, and thirty directors; the latter body being chosen annually from among the governors.

Plans so extended required, for their accomplishment, the possession of very ample funds, if, indeed, success could be reasonably hoped from any efforts, however powerfully supported, where the directing body was so far removed from the sphere of action, and must necessarily intrust the execution of its schemes to agents whose views and interests might not coincide with those of the London directors. The subscriptions obtained at the first establishment of the institution were considerable both in number and amount, but they very soon fell short of the sum required, so that in 1815 its permanent income was already considerably below 500*l.*

In the first year of its establishment, the institution sent out to Sierra Leone three African youths, who had been instructed on the plans of Dr. Bell and Joseph Lancaster; it gave directions for engaging persons qualified to teach the Arabic and Sowsoo languages; conveyed various seeds and plants to different parts of the coast, and distributed them among the natives, together with proper instructions for their culture and management; it provided machines for cleaning cotton, and a press for expressing the oil of the castor-nut; and it offered premiums to the importers of cotton, rice, indigo, and coffee of African production. With all this, its vigilance was unceasing to detect infractions of the abolition law, and the exertions of the directors were successfully applied towards the obtaining of an act of parliament declaring the slave trade a felonious crime.

If the success of the institution as regards its benevolent views of enlightening the natives has not hitherto been rendered very apparent, we must not thence conclude that its exertions have been altogether abortive. Men in a state of savage nature have never all at once become convinced of the benefits of the arts of civilization; and it appears inevitable, that in every effort to that end, much exertion must be employed fruitlessly, or to the production of a seemingly inadequate good. However small that portion of immediate good may be, we may yet hope that in the present case its ultimate effects will be such as not to disappoint the sober and rational hopes of the philanthropist.

AFRICA'NUS, LEO. [See Leo Africanus.]

AFRICA'NUS, SEXTUS JULIUS, a Christian writer of the third century, is considered by some authors to have been a native of Africa, and was, according to Cave, bishop of Emmaus, A.D. 232. Clavier, in the *Biographie Universelle*, makes him the descendant of an African family, and born in Palestine. Between the years 218 and 222, A. D., Africanus was employed in an embassy to the Emperor Heliogabalus for the restoration of Emmaus, which city, in consequence of his entreaties, was rebuilt under the name of Nicopolis. He attended the lectures of the bishop Heraclius at Alexandria, some time before the year 231.

Eusebius ascribes to Africanus a work which contains, under the title *Kesti*, a collection of passages from various authors, chiefly on physical, mathematical, and other topics which belong to domestic economy, medicine, botany, mineralogy, and the military sciences. Fragments of this work are printed among the *Mathematici Veteres*, Paris, 1693, folio, and reprinted in the 7th volume of the works of Meursius, Florence, 1746, but it is not quite certain whether this work contains the real *Kesti* of Africanus. It has been translated by Guischardt, in his *Mémoires Militaires des Grecs et des Romains*, 1758, in 4to. There exists, also, a translation by Africanus of the book of Abdias of Babylon, under the title *Historia Certaminis Apostolici*, 1566, 8vo.

The word Kestos signifies in the Greek language a girdle of various colours. Probably the title Kesti alludes to the different hues of an embroidered girdle, or to the magical power of the girdle of Venus. The *Kesti* teach, among other things, how to grow fruit in the shape of animals, or of the human countenance, and how to produce pomegranates without kernels, and figs of various colours, &c.

Valesius, Scaliger, and others, considered the contents of the Kesti to be unworthy of the Christian chronologer, Africanus, and attribute them to a pagan philosopher called Sextus; and Jerome omits the *Kesti* in his list of the works of Africanus. But Eusebius, *Hist. Eccl.* vi. 31. ed. Vales. p. 295, Suidas, Vossius, Wetstein, and others, ascribe the *Kesti* to Africanus. Compare Hamberger's *Zuverlaessige Nachrichten*, tom. ii. p. 525.

Africanus wrote a chronological work in five sections under the title of *Pentabiblos*, containing, as some learned men think, an abridgment and a continuation of Manetho's work. The *Pentabiblos* contained a sort of universal history, composed to prove the antiquity of true religion and the novelty of paganism. Fragments of this chronology are extant in the works of Eusebius, Syncellus, Malala, Theophanes, Cedrenus, and in the *Chronicon Paschale*. The *Pentabiblos* commences with the Creation, 5499 B.C. and closes with 221 A.D. The chronology of Africanus places the birth of Christ three years before the commencement of our æra. But under the reign of Diocletian, ten years were taken from the number which had elapsed, and thus the computation of the churches of Alexandria and Antioch were reconciled. [See Æra.]

According to Fabricius, *Bibl. Gr. ed. nova*, viii. p. 9, there exists at Paris a MS. containing an abstract of the *Pentabiblos*. Scaliger has borrowed, in his edition of *Eusebius*, the chronology of Africanus extant in *Geo. Syncelli, Chronographia ab Adamo ad Dioclesianum, à Jac. Goar, Gr. et Lat.* Paris, 1652, fol.

Africanus wrote a learned letter to Origen, in which he disputes the authenticity of the apocryphal history of Susannah. This letter has been printed at Basle, in Greek and Latin, 1674, 4to.

A great part of another letter of Africanus to Aristides, reconciling the disagreement between the genealogies of Christ in Matthew and Luke, is extant in Eusebius's *Ecclesiastical History*. In order to reconcile the difference between the genealogies, he has recourse to the law of adoption among the Jews, by which brothers were obliged to marry the wives of their brothers who died without children.

The fact of a man so learned and intelligent as the chronologer Africanus being a Christian, refutes the error of those who think that all Christians in the first centuries of our æra were illiterate. The criticisms of Africanus upon the apocryphal books seem to attest that he did not receive the canonical writings of the New Testament without previous examination; and from his manner of reconciling the different genealogies of Christ, it appears certain that he recognised the authenticity of the Gospels in which they occur.

AFTER-MATH is the grass which grows after the hay has been made; it is also called latter-math, rowen, or rowett, and when left long on the ground it is called *fogg* in some places. Where the land is rich and hay valuable, the aftermath is often mown and made into hay. This hay is inferior in value and nourishment to the first crop, which contains the flower-stalks of the grass. It is not good for horses, especially those which are driven fast and work hard; it is thought injurious to their wind. Cows and sheep are fond of it, and with them it is not liable to the same objection. Whether it be more profitable to cut a second crop of hay, or to feed off the aftermath, must depend on circumstances and situations. Unless the meadows can be irrigated, or well manured, taking off two crops of hay in one year exhausts them, and is apt to produce moss, which the tread of sheep and cattle prevents.

There is a practice with some farmers to leave the aftermath on the ground from hay-making time to the next spring; this is then called *fogg;* and the young grass, springing up through the old, makes it palatable to young cattle. Arthur Young mentions this practice with some commendation, as a resource in spring; but it does not accord with a well-regulated system of husbandry, in which all food should, if possible, be given in its most perfect state. The fogg, half rotten by a wet winter, cannot be wholesome food; besides, slugs and various insects breed in it. The aftermath should be fed off clean before winter. A good farmer should have hay, straw, and roots sufficient for his stock. Swedish turnips, mangel wurzel, carrots, &c., can be stored in winter and strewed upon the pastures in spring, by which the stock will be better fed, and the land improved.

AGA, the name of a dignity, and also an epithet of respect, among the Turks. It signifies literally a great man, a lord, or a commander. Some etymologists assert, that the original meaning of the word is a baton, taken as the ensign of command. In Turkey, the Aga of the janissaries, while that corps subsisted, was their commanding officer or colonel, whose place was one of high authority and dignity in the state. There is also the spahilar-aga, that is, the colonel of the spahis, or cavalry. Aga is likewise the common epithet of civility used in addressing or speaking of the eunuchs employed in the seraglio; and their chief is distinguished by the title of Capi Aga. The Capi Aga, or Capi Agassi, as he is often called, is one of the principal officers of the court of Constantinople.

AGAME'MNON, King of Mycenæ, and commander-in-chief of the Grecian army at the siege of Troy. According to the fabulous genealogies of the poets, he was fourth in descent from Jupiter, and grandson to Pelops, who came from Asia into Greece, and laid the foundation of a new dynasty of princes, which soon supplanted the older race of the Danai. Pelops acquired the kingdom of Pisa by marriage. Atreus, son of Pelops, being banished from his father's house for having slain his brother Chrysippus, fled to Mycenæ, where his sister's son, Eurystheus, grandson of Perseus, then reigned. He ingratiated himself so much with the people, that he was chosen king on the death of Eurystheus, and left the sceptre to his eldest son, (or, some have said, grandson,) Agamemnon. The dominion of Mycenæ comprehended the northern part of Argolis, Corinth, and Sicyon, with the territories annexed to them, and

Ægialos, afterwards called Achaia; thus including the whole northern coast of Peloponnesus. Menelaus, second son of Atreus, obtained the kingdom of Lacedæmon by marriage with Helena, daughter of Tyndareus and Leda. The southern and larger portion of Argolis, though governed by a monarch of its own, was probably dependent to a great degree on its more powerful neighbour of Mycenæ. It does not appear who inherited the kingdom of Pisa after Pelops: none of the four chiefs who led the Eleians to Troy were of his family, so that the degree of influence which the Pelopid princes possessed over Elis can hardly be ascertained. A large portion of Messenia, according to Strabo, was occupied by colonists who followed Pelops from Asia. Thus, in at least four, probably in five, of the six principal divisions of Peloponnesus, (Arcadia being the one excepted,) the house of Atreus had a direct family interest and influence. The exact nature of the influence is not easily defined: but the best authorities concur in bearing testimony to its existence. Homer mentions the sceptre of Agamemnon as the emblem of authority 'over all Argos (Peloponnesus) and many islands:' and Thucydides expresses his belief that the above-named monarch 'assembled the Grecian forces, not so much through favour, as fear.'

In the earliest and most credible authors, Homer and Hesiod, we find no trace of the long train of horrors which laid waste the house of Pelops, according to later writers, and especially the tragedians. At present we shall confine ourselves to relating what bears some mark of historical truth. The history of Agamemnon, before the Trojan war, is comprised in two sentences: he was the son of Atreus, whence he and his brother were called Atridæ, according to the Grecian custom of giving to the son a *patronymic* name, or a name formed according to certain rules from the *name of the father*; and he married Clytemnestra, sister of Helen. The Trojan war arose out of the abduction of Helen by Paris, otherwise called Alexander, son of Priam, King of Troy. It is commonly said, that a number of the princes of Greece having been drawn together as suitors by the extraordinary beauty of Helen, Tyndareus exacted an oath from them, that on whomsoever the choice should fall, if the maid should be carried off, all the rest should unite to recover her: and that in virtue of this oath, the confederate princes assembled under the command of Agamemnon. In reference to this story, Thucydides has expressed his belief, 'that Agamemnon got together that fleet, not so much for that he had with him the suitors of Helena, bound thereto by oath to Tyndareus, as for this, that he exceeded the rest in power.' In continuation, the historian lays great stress upon his naval power, as evinced by his being, in Homer's words, 'king of many islands,' and by his lending sixty ships to the Arcadians, besides conducting a hundred filled with his own followers, a larger number than was led by any other chief.

The assembled fleet was detained at Aulis by contrary winds. The seer Calchas, being consulted how the anger of the gods might be averted, and the delay obviated, declared that Iphigenia, daughter of Agamemnon, who had incurred the displeasure of Diana by killing her favourite stag, must be sacrificed to the goddess. The natural reluctance of the father was overcome by importunity and ambition; and the intended victim was summoned to Aulis, under pretence of betrothing her to Achilles. At the point of death she was miraculously saved by Diana, whose priestess she afterwards became among a savage people of Asia, called the Tauri. This story is related neither by Homer nor Hesiod: it rests, however, on the early authority of Pindar, Pyth. ii., and Æschylus; and is pregnant with too important consequences to be omitted, since the alienation of Clytemnestra from her husband is said by those authors to have originated in her horror of this unnatural action. The siege of Troy was protracted for ten years. The most memorable event of it is the quarrel between Agamemnon and Achilles, the subject of the Iliad; in which the former placed himself very completely in the wrong. Homer represents him as brave, and expert in arms, insomuch that when a Grecian warrior was selected by lot who should contend with Hector in single combat, it was the general prayer that the lot might fall on Ajax, Diomedes, or Agamemnon. Still it is as the commander, rather than as the soldier, that he is presented to our notice, and usually with some reference to his wealth and power; 'king of men' is the distinguishing epithet constantly added to his name, as 'swift footed' is to the name of Achilles. Hesiod also (Fragm. 48) says that the Olympian god has given strength to the descendants of Æacus, wealth to those of Atreus. Returning from Troy he was treacherously murdered by his wife; who, during his absence, had formed an adulterous attachment to Ægisthus, son of his uncle Thyestes. This catastrophe is the subject of the Agamemnon of Æschylus, one of the most sublime compositions in the range of the Grecian drama. Orestes, son of Agamemnon, then a child, was saved by the care of his tutor, and timely flight. After passing seven years in exile, he returned in secret, avenged his father's death by the slaughter of his mother and of Ægisthus, and recovered his paternal kingdom, which he ruled with honour.

These legends of the house of Agamemnon formed a favourite subject with the Greek tragedians. Three of the seven remaining plays of Æschylus are founded on it, the *Agamemnon*, the *Chophorëi*, which has for its subject the revenge of Orestes, and the *Eumenides*, which relates the remorse and madness of Orestes, and his trial and acquittal before the Athenian court of Areiopagus. The Electra of Sophocles has the same subject as the Chophorëi. Euripides has two tragedies on the story of Iphigenia; and one called the Electra, which has the same subject as the Chophorëi and Electra of Sophocles, but is much inferior to both of them. The Orestes of the same author relates the history of Orestes subsequent to the death of Clytemnestra.

A'GAMA, in zoology, a genus of reptiles belonging to the order of saurians, and family iguanians, as established by Baron Cuvier in the *Règne Animal.* The division to which this genus appertains is one of the four natural orders into which M. Brogniart distributed the whole class of reptiles or amphibia of Linnæus, and in which he has been followed by the most judicious subsequent zoologists. The earlier division by which Linnæus proposed to arrange the amphibia in two orders, reptiles and serpents, or those with and those without feet, though plausible in appearance, and, to a certain extent, readily applicable to practical purposes, is, in reality, but little conformable to the physical nature and zoological conformation of these animals; because its principles do not comprehend all the characters which direct and influence their habits and economy. M. Brogniart, in joining to the Linnæan principle of division taken from the organs of locomotion, the additional consideration of the comparative quantities of respiration in this class, has laid the foundation of a distribution more agreeable to the system of nature, and, as far as it goes, perhaps, more satisfactory, than the primary divisions in any other class of animals. The four orders thus established by M. Brogniart, and now generally admitted by naturalists, are, 1st. the *Chelonians,* (or tortoises and turtles,) which have two auricles in the heart, four legs, and the body defended by two large plates or bucklers, the upper formed by the union and dilatation of the ribs, and the lower by the sternum: 2d. the *Saurians,* (or lizards,) with two auricles in the heart, four, or, in a few instances only, two legs, and bodies covered with scales; 3d. the *Ophidians,* (or serpents,) with two auricles in the heart, no feet, and bodies generally covered with scales: and 4th. the *Batrachians,* (or frogs, toads, salamanders, &c.,) which have only one auricle in the heart, four, or rarely two legs, and naked bodies; and which, moreover, like the insect tribes, are subject to a metamorphosis, passing, with age, from the state of a fish which respires through gills, to that of a quadruped breathing air by means of lungs. The example of this last order presented by the tadpole or young frog, and of the transformation which it undergoes upon assuming its perfect reptile form, are familiar to every one.

Having given this general preliminary view of the principles of classification established in this class of animals, in order that the reader may be enabled to comprehend the precise import of the terms which we are obliged to employ, it is only necessary to observe farther, that Baron Cuvier has subdivided the order, saurians, into six natural families, distinguished from one another by peculiar and influential characters. Of these the iguanians are the third in order; they differ from the other families chiefly in the nature of the tongue, which is thick, fleshy, and attached to the under-jaw; consequently, without the power of being protruded, as in the generality of reptiles. The tongues of the crocodiles and alligators, indeed, are of the same form; but from these destructive reptiles the iguanians are zoologically distinguished by their long flexible toes not united by membranes, and generally by their diminutive size, round tails, and small imbricated scales. M. Cuvier again subdivides the family iguanians into two smaller sections, or sub-families; the iguanians, properly so called, which, besides the ordinary series of maxillary or jaw-teeth, have likewise two small additional rows on the posterior margin of the palate; and the agamians, which want these additional or palatic teeth. To the latter sub-family, of which, indeed, it is the type, belongs the genus agama, the subject of the present article, and of which we proceed to describe the characters, and a few of the principal species.

In the form of their heads and teeth the agamas resemble the common lizards, but differ in the imbricated scales which cover their tails. These animals have the body thick and shorter in proportion than the generality of the saurian family; the skin is lax and capable of being distended or puffed out with air at the will of the reptile: the whole body, as well as the head, neck, and feet, is covered with minute rhomboidal or hexagonal scales, often prolonged in the form of little spines, and bristling when the body is inflated with air. The head is short, broad, and flat, particularly towards the occiput; the neck also is short, and the tail seldom longer than the body. These proportions give the agamas much of the hideous and disgusting appearance of toads, and, indeed, Seba and other authors have occasionally confounded them with these reptiles. In many parts of South America they are called chameleons, from their power of dilating the skin with air, and thus, to a certain extent, imitating these animals in the various hues which they are capable of assuming. In other respects the various species of agamas differ so considerably from one another, as to have induced Baron Cuvier to arrange them in separate subgenera, distinguished by the form of their scales and the presence or absence of pores in the thighs. Spix, and some other writers, are inclined to regard these distinctions as real generic characters, but they are obviously of too little importance, and exercise an influence too confined over the habits and economy of the animals, to warrant us in adopting the ideas of these zoologists. We shall therefore follow the more judicious sentiments of M. Cuvier, in regarding these subdivisions as of no intrinsic value in themselves, but merely useful, as a practical means of distinguishing the species. It will be sufficient at present to indicate these different subgenera, and to refer to the works of the above-mentioned naturalists for a more particular account of their several and respective characters. Generally speaking, the agamas have no thigh pores; some, however, are provided, as is the case with many other saurian reptiles, with a row of these pores along the inner surface of each thigh; some species have the toes so short and rigid as to compel them to live entirely on the surface of the earth, where they reside among rocks and heaps of stones, and conceal themselves in the crevices; others again, which have long and flexible toes, ascend trees with great facility, and sport among their branches with the utmost security. All are of a diminutive size, and, like most other reptiles, feed upon insects and other small animals: one or two species, nevertheless, are reported to be herbivorous. Their geographical distribution is very extensive, and embraces all the hot and temperate parts of the known world: Asia, Africa, Australia, and South America have each their appropriate species, which often differ from one another so slightly, that much confusion still prevails among their characters and synonyma. The most remarkable species are, of those without pores on the interior face of the thighs,—

The muricated agama (*Ag. Muricata, Cuv.*), first described by the celebrated John Hunter in the zoological part of White's *Voyage to New South Wales*. It is one of the most common lizards of that colony; measures upwards of a foot in length, comprehending the tail, which is twice as long as the body, and, from the great length and perfect division of its toes, readily ascends trees, and lives entirely in the woods, where it hunts about for insects and caterpillars. Its general colour is a brownish grey, marked with dusky bars, which run in a longitudinal direction on the body, but transversely on the legs and tail. The scales which cover the upper and outer parts of the trunk and extremities are rhomboidal, and carinated, or elevated into sharp-pointed ridges, forming parallel lines or rows of spines upon the back and sides, from the shoulders to the very point of the tail. The head is covered with similar scales, all directed backwards and prolonged upon the occiput into a crest of weak spines. The toes of all the feet are well separated, and furnished underneath with small pointed scales; the two middle toes of the hind feet are nearly twice the length of the others.

[Agama muricata.]

The Agama Barbata of Cuvier is another species from the same locality. It is rather larger than the muricated agama, but preserves the same relative dimensions, and lives in the forests in the same manner. A range of large spinous scales passes in transverse bands over its back and tail, and the throat is covered with long-pointed scales, forming a sort of beard, though neither so strong nor so conspicuous as in the guanas. Similar scales cover the sides and form two oblique crests behind the ears; the belly is spotted with yellcw, and the throat is capable of being distended at the will of the animal. This species is likewise figured and described in White's *Voyage*, p. 255, but was considered by Mr. Hunter as a mere variety of the former.

Other species of this division, having pores on the inner surface of the thighs, are the *Leiolepis* (A. Guttata) of M. Cuvier, of Cochin China, with white rays and spots on a bright blue ground; the *Tropidolepis* (A. Undulata), of a uniform dark blue colour with a white cross on the throat, and which, as well as the kindred species, *A. Nigri-Collaris* and *A. Cyclurus*, described by Spix, inhabits various parts of South America; the *Brachylophes* (A. Vittata), which seems to form the connecting link between this genus and the

[Agama aculeata.]

guanas, from which latter it is distinguished only by the absence of teeth in the palate; it is found in India, and has light blue bands upon a dark blue ground: and, lastly, the *Physignathes* (A. Cocincinus), from the Malayan peninsula, remarkable for its large size, uniform blue colour, but more particularly from being one of the very few species of saurian reptiles which feed upon vegetable substances; Baron Cuvier assures us that it lives entirely upon fruits and nuts. Of the agamas without pores in the thighs, the principal species are, the *Spinous Agama* (A. Aculeata) of a yellowish grey colour with numerous transverse brown bands. All the upper parts of the body are covered with elevated scales, forming small pointed pyramids of four sides; the body is short and thick, the tail likewise short, the head broad and flat, and the belly protuberant. Excepting in the length of the tail and the body being covered with scales, the whole animal has much of the form and appearance of a frog or toad: it is found at the Cape of Good Hope, and is of larger size than the generality of the other species.

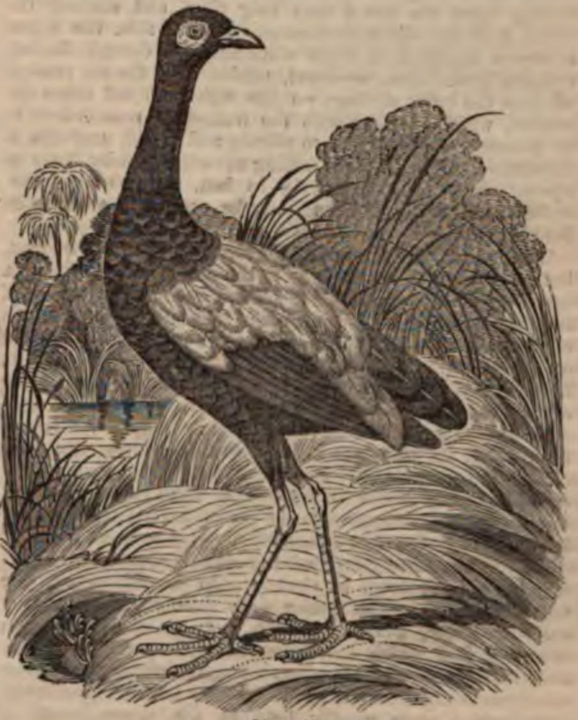
The *Tapayaxin* (A. Orbicularis), of Mexico, is very similar to the species last described in its form and proportions, but is still shorter and thicker. The extraordinary figure of this reptile, approaching almost to the form of a perfect sphere, its broad flat head, its skin covered with small tubercles or warts interspersed among the scales, and the faculty which it possesses of distending its body with air, and to a certain degree assuming different shades of colour, have caused it to be sometimes compared to a toad, and sometimes to a chameleon; but the truth is, that it has no actual relation or affinity to either of these animals, but is indebted solely to its naturally disgusting aspect, for the calumnies which the early Spanish writers have heaped upon it. The scales of this species are small, pointed and rough on the upper parts, smooth and flat beneath; on various parts of the back they are elevated into insulated spines, ranged in six or eight longitudinal rows, but without much regularity: the ground colour is dark grey above, with irregular brown blotches, and beneath yellowish red, speckled with small black spots. The legs are short and thick and the toes of equal length, both before and behind. The tapayaxin inhabits the mountainous and rocky parts of South America, from the Isthmus of Darien to Patagonia; according to Ray, it is capable of domestication, and even recognises and shows a kind of attachment to those who feed it.

Other subgenera and species belonging to this division of the agamas are *Trapelus* (A. Ægypticus), remarkable for its change of colour, even more sudden than that of the true chameleon; the *A. Calotes*, of a bright blue colour with transverse white marks on the sides, from the Mollucca Islands; the *Lophyres* (A. Gigantea, Kuhl), with a crest of long elevated spines on the neck; and the *Lyriocephalus* (A. Scutata), which has a similar elevated crest along the back, and the tail keel-shaped. This latter species, in many respects a most singular reptile, inhabits Bengal, and lives upon fruits.

In the short account which we have here given of this extensive genus, we have confined our remarks principally to the general characters and most remarkable habits of these animals, as far as the latter have been observed; but it is to be regretted that we possess fewer authentic observations upon the manners and economy of reptiles, than of almost any other class of animals. Of the many thousand different species of reptiles enumerated in the most complete catalogues of zoologists, it may be safely affirmed, that we do not know the habits of as many dozens; yet this defect of information is to be attributed only to the inattention or ignorance of travellers, for these animals afford at least the same facilities for observation and experiment as mammals and birds, and much greater than fishes or insects. For ample details concerning the specific differences of the agamas, we refer the reader to the works of Cuvier, Dandin and Merrem.

A'GAMÆ, in botany, is a name given by some authors to the large division of the vegetable kingdom, called Flowerless, and may be considered equivalent to the older term, Cryptogamic plants. The word, which means sexless, has been proposed upon the hypothesis that the whole of the flowerless class is absolutely destitute of stamens and pistilla. Although few persons can now be found who entertain any doubts as to such a fact, yet the invention of a new term in consequence, has been generally considered superfluous. It may be perfectly true, that ferns, and mosses, and lichens, and confervæ, and fungi, are wholly destitute of sexual organs, and yet the term agamæ may be unnecessary: for this reason it is seldom employed.

A'GAMI (*Trophia crepitans*, Latham), an interesting bird, sometimes also termed the gold-breasted trumpeter, classed by Pallas among cranes, by Brisson among pheasants, and making the first genus in Temminck's *Alectorides*. It is the size of a pheasant or large fowl, being twenty-two inches in length, but appears larger from having a long neck, and from standing high on its legs. It bears some slight resemblance to the pheasant in the glossy iridescent green on the breast, and in a space round the eyes naked of feathers; but has a very short tail, consisting of twelve black feathers, over which the long, loose, silky scapulary rump plumes hang droopingly. Its long greenish legs assimilate it to wading birds (*Grallatores*), but it is said not to have the habits of these, never visiting fens and the margins of water, and living wholly in upland forests and arid mountains. It inhabits the forests of tropical America, and never visits the cleared grounds or the settlements. According to M. Monoucour, it is very gregarious, being found in numerous flocks, which walk and run, but rarely fly, and, when they do, seldom rise more than a few feet above the surface of the ground. Even when pursued they trust most to their speed in running.



[Agami.]

Several naturalists have given accounts of the Agami in a domestic state. Its docility and attachment to man are remarkable. 'The Agami,' says Monoucour, 'is not only tamed easily, but becomes attached to its benefactor with all the fondness and fidelity of the dog; and of this disposition it shows the most unequivocal proofs. When bred up in the house, it loads its master with caresses, and follows his motions; and if it conceives a dislike to persons on account of their forbidding figure, their offensive smell, or of injuries received, it will pursue them sometimes to a considerable distance, biting their legs, and testifying every mark of displeasure. It obeys the voice of its master, and even answers to the call of all those to whom it bears no grudge. It is fond of caresses, and offers its head and neck to be stroked; and, if once accustomed to these familiarities, it becomes troublesome, and will not be satisfied without continual fondling. It makes its appearance as often as its master sits down to table, and begins with driving out the dogs and cats, and taking possession of the room; for it is so obstinate and bold, that it never yields, and often, after a tough battle, can put a middle-sized dog to flight. It avoids the bites of its antagonist, by rising in the air, and retaliates with violent blows with its bill and nails, aimed chiefly at the eyes; and after it gains the superiority, it pursues the victory with the utmost rancour, and, if not parted, will destroy the fugitive. By its intercourse with man, its instinct became moulded like that of the dog; and we are assured that it can be trained to tend a flock of sheep. It even shows a degree of jealousy of its rivals; for, when at table, it bites fiercely the naked legs of the negroes, and other domestics, who come near its master.'

The peculiar noise which these birds make, without opening the bill, is one of their most remarkable characteristics. This noise is no doubt produced by a peculiar conformation of the organ of sound. According to Pallas, the *larynx*, which is on the outside of the breast, is about as thick as a swan's quill and almost bony, becomes much more slender, loose, and cartilaginous when it enters within the breast, where two semicylindrical canals of a membranous texture, and capable of being extended, proceed from it. The air-bag on the right side descends to the pelvis, and within the breast it is divided into three or four cells by transverse membranes. The air-bag on the left side is narrower. Vosmaër tells us that the sound is sometimes preceded by a wild cry, interrupted by a call somewhat like 'scherck, scherck,' and then follows the characteristic noise somewhat resembling the cooing of pigeons. It utters, in this way, five, six, or seven times, with precipitation, a hollow noise nearly resembling the syllables 'too, too, too, too, too, too,' resting upon the last a very long time, and sinking the sound gradually till it terminates. During this, the breast is seen to heave, as in birds, while singing, though the bill remains shut. It is, no doubt, produced by the air pressed up from the lower air-bags on the right and left above described, which meeting with the transverse membranes in its passage, causes them to vibrate and sound, and this is communicated to the surrounding muscles, and by these to the external air; so that it is, in fact, a sort of ventriloquism, and requires not the bill to be opened in order to be heard.

The Agami, like the rest of the alectorides, builds no nest, but scratches a shallow place at the root of a tree where it deposits its eggs, from ten to sixteen in number, and of a light green colour. They are somewhat larger than a hen's egg, and of a rounder form. The down remains a long time on the young, and grows into long silky plumes very close, like fur, and it is not till they are one-fourth the size of the adult birds, that the true feathers appear.

Dr. Latham tells us, that 'one of these Agamis, a young bird, found its way into a farm-yard in Surrey, and associated with the poultry. It was perfectly tame, and, on one occasion, accompanied the hounds for three miles, and kept up with them. It was last in the possession of Lord Stanley, but died on its way into Lancashire.'

A'GAPÆ, the plural of the Greek ἀγάπη, (*agape*,) which signifies love, or charity. In the history of the Christian church, the agapæ were those meetings of the early believers, where they sat and ate, at a common table, of food which had been provided by the voluntary contributions of the members of the society, the entertainment being concluded with the holy kiss. These meetings, which were usually held in the same house or apartment in which they assembled for divine worship, are at least mentioned once in the *New Testament*, namely, in the 12th verse of the epistle of Jude, where it is said of certain unworthy brethren, 'these are spots in your feasts of charity:' the Greek word here is *agape*. It is probable also that St. Paul alludes to the same thing in 1 *Cor*. xi. 20, where his language would seem to imply that the agapæ had been originally instituted chiefly for the purpose of celebrating the sacrament of the Lord's Supper. But whether they arose in this way, or from those feelings of brotherhood and that charity towards their poorer brethren which were so strongly inculcated upon the first followers of Christianity, both by the religion they professed and the circumstances amidst which they were placed, it is certain that even in the days of the apostles these meetings had been occasionally perverted from the purpose of their institution. St. Paul, in the passage to which we have just referred, charges the Corinthians that, when they came together into one place, 'in eating every one taketh before other his own supper; and one is hungry and another is drunken.' And he continues, 'What? have ye not houses to eat and to drink in?' concluding, after an explanation of the solemn and spiritual manner in which the holy supper ought to be partaken of, with the general direction, 'Wherefore, my brethren, when ye come together to eat, tarry one for another. And if any man hunger, let him eat at home.' These love-feasts also gave great occasion of scandal to the enemies of the faith. The reader may find an account of the accusations of which they were made the groundwork by some of the pagan writers in the sixteenth chapter of Gibbon's History. They seem, however, to have continued to be generally celebrated for several centuries. Ecclesiastical writers mention three kinds of them,—first, those which took place at marriages, called the nuptial or connubial agapæ, to which the bishop or pastor was usually invited: second, the anniversary, or, as they were called, natal agapæ, which were held in the churches on the festivals of the martyrs: and, third, the funeral agapæ, at the interments of members of the congregation. The celebration of the love-feasts in the churches was at length expressly forbidden by the 25th canon of the council of Laodicea, in A.D. 364; although the enactment would seem for a considerable time not to have been quite effectual, since we find it repeatedly renewed by subsequent councils. Nor does the practice under improved regulations appear to have been discontinued in all circumstances by the heads of the church. In the sixth century, as we are informed by Bede, Pope Gregory, in his instructions to Austin when he sent him to Britain to convert the Saxons, advised him to allow the new converts to feast together on saints' days, and the anniversaries of the dedication of the churches, not in the churches themselves, but in sheds fashioned with green boughs close by them, to the glory, he says, of God, as they had formerly done to the honour of the devil. A great deal of ingenious speculation has been expended in the attempt to discover traces of the Christian agapæ, both among the Jews and pagans before the institution of our religion, and in the latter times of the church. But the only thing exactly corresponding to the primitive love-feast is the practice which has been introduced under the same name by certain modern sects, especially the Moravians and the Sandemanians.

AGAPHITE. [See TURQUOISE.]

AGARI'CIA, (Lamouroux.) The mushroom madrepore, a genus of coral madrepores, so called from its resemblance in form to mushrooms (*Agarici*). The animal inhabitants of agaricia are unknown, with the exception of a single species observed by M. Lesueur on the shore of St. Thomas in the Antilles. Lamarck enumarates five, and Parkinson seven species.

AGA'RICUS is the generic name by which all the species of mushrooms properly so called are collectively known. It comprehends such plants of the fungus tribe, as have a cap (or pileus) of a fleshy nature, supported upon a distinct stalk, and a number of parallel unequal vertical plates or gills arising out of the cap, and inclosing the particles by which the species are reproduced; particles which the vulgar call seeds, and the learned sporules. This genus consists, according to the latest writers, of not fewer than a thousand species, inhabiting meadows, and heaths, and rocks, and masses of decaying vegetable matter, in all Europe, and in many other parts of the temperate regions of the earth. Among them, a large proportion are poisonous, a few are wholesome, but by far the greater are altogether unknown in regard to their action upon the human constitution. The species are often extremely similar; there is no means of distinguishing botanically the tribes that are poisonous from such as are wholesome, but in every case practice is requisite to determine that point independently of general structure. It is for this reason that the use of wild mushrooms is so dangerous, and that a French botanist, of no little celebrity, would never suffer any to be brought to his table that had not been raised by art in a garden. Indeed there is this most remarkable fact connected with their qualities; a fact which seems to show that their properties depend upon climate and situation, and accidental circumstances, rather than upon any specific peculiarities; those kinds which are wholesome in one country are not so in another; thus, in Great Britain, the common mushroom (*Agaricus campestris, fig.* 1.), the fairy ring agaric (*A. pratensis, fig.* 2.), and the *A. Georgii*, are the only sorts that it is quite safe to eat; while the Fly agaric (*A. muscarius, fig.* 3.) and *A. virosus* (*fig.* 4.) are extremely poisonous. But in other countries of Europe it is different. In France, in Italy, and especially in Russia, a usual aliment is afforded by a great variety of species which, although very common in this country, it would be extremely dangerous to eat; and, on the other hand, even the dangerous A. muscarius is a species of food in Kamtschatka.

We propose to point out in this article what the distinctions are, by which it has been supposed that the eatable and poisonous species may be recognized, because the reader of such a work as this would be more likely to be misled by imperfect descriptions than benefited by speculative distinctions. We shall therefore confine ourselves to a few easy, plain, and intelligible observations, which it is to be hoped cannot possibly lead to error.

Of the thousand species thus much is certain, that all having the following characters are poisonous:—

1. Such as have a cap very thin in proportion to the gills.
2. Such as have the stalk growing from one side of the cap.
3. Those in which the gills are all of equal length.
4. Such as have a milky juice.
5. Such as deliquesce; that is, run speedily into a dark watery liquid.
6. And lastly, every one that has the collar that surrounds the stalk filamentous, or resembling a spider's web.

As to the rest, the *only eatable* kinds that can be safely employed in Great Britain are the following:—

A. campestris, the common mushroom, (fig. 1,) the species that is so commonly raised artificially for food. This is readily known in any state by its fragrant odour, by which alone it may be always recognized, and the absence of which is extremely suspicious. When in a very young state, it resembles little snow-white balls, which are called *buttons;* afterwards it acquires a stalk, separates its cap, and becomes shortly conical, with liver-coloured gills, and a white thick fleshy cap, marked with a few particles of grey. At a more advanced age the cap is concave, the colour grey, and the gills black; in this state it is called a *flap*. For the method of cultivating it, and for its physiological characters, see MUSHROOM.

A. Georgii is like the latter, but its gills are always very pale, and its flavour inferior. It is said occasionally to weigh as much as fourteen pounds.

A. pratensis, or *oreades*, the fairy-ring mushroom, is so well known by its popular designation as to require no description. Well may it have gained that name; for, in former times, there would, doubtless, be great difficulty in imagining how such productions could spring up in a few hours in the regular rings they appear in, without the aid of some supernatural agency. The use to which this species is usually applied is that of being powdered and mixed with rich sauces, after having been previously strung upon a line, and dried in the shade.

[Eatable Agarici.]

[Poisonous Agarici.]

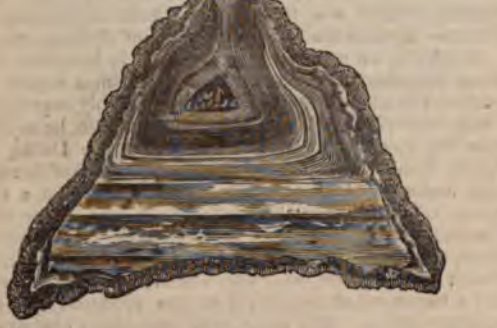
Those who have curiosity and courage to adventure on determining the qualities of others of this family may consult the works of Persoon, De Candolle, Withering, and other writers, in which they will find ample information. But before commencing their experiments, we would recommend to their attention the following circumstance.

A lieutenant in the French army ate some mushrooms supposed to be of a wholesome kind, at ten in the morning. At seven in the evening he was attacked with severe colic; at ten his wife began to experience the same sensations, attended with nausea. In the course of the night they were both attacked with violent vomiting and purging, accompanied by intense thirst. This was succeeded by severe cramps, and the pulse became hard, weak, rapid, and irregular. At ten the next morning the husband died, and the wife at six in the evening. But the person from whom the agarics had been procured, as well as all his family, had eaten abundantly of them without inconvenience. Upon a careful inquiry, it appeared that the latter had well salted, then boiled for some time, and afterwards pressed the agarics before eating them,—precautions which the unfortunate lieutenant had neglected.

AGA'SIAS, a Greek sculptor of Ephesus, whose age is not accurately known. The statue now at Rome called the Borghese Fighter, which is a fine specimen of skill in representing a figure in action, and also shows a careful study of external anatomy, is the work of this Agasias. On the support behind the figure is the following inscription in Greek.—*Agasias the son of Dositheus of Ephesus made it*

A'GATE, an ornamental stone used in jewellery, and for some purposes in the arts: it is sometimes called Scotch pebble. The name is derived from the Greek ἀχάτης (achates), a stone described by Theophrastus, and which, he says, came from the river Achates, in Sicily; now the Drillo, in the Val di Noto. It is one of the numerous modifications of form under which silica presents itself, almost in a state of purity, constituting in the agate 98 per cent. of the mineral. The siliceous particles are not so arranged as to produce the transparency of rock crystal, but a translucent, sometimes almost opaque substance, with a resinous or waxy fracture; and a variety of shades of colour are produced by a minute quantity of iron. The same stone sometimes contains parts of different degrees of translucency, and of various shades of colour; and the endless combinations of these produce the beautiful and singular internal forms, for which, together with the high polish they are capable of receiving, agates are prized as ornamental stones. Although occasionally found in other rocks, they are most usually met with in that variety of the trap rocks called Amygdaloid or Mandelstein, forming detached rounded nodules, not cemented to the base or mass of the rock, but easily separable from it, and having generally a thin layer of green earth interposed, and a rough irregular exterior, as if moulded on the asperities of the sides of a pre-existing cavity. The siliceous particles have often, but far from constantly, arranged themselves in thin layers parallel to the external surface of the nodule; sometimes the nodule is not solid, but a hollow space is left in it, studded with crystals of quartz; and not unfrequently crystals of carbonate of lime and other minerals, totally distinct in composition from that of the agate, are superimposed on those quartz crystals.

The theory of the formation of agates is a problem of great difficulty, and we must be much further advanced than we are, in our knowledge of the chemical processes of nature in the mineral kingdom, before we can expect to throw any light on this very obscure subject. The great supply of agates is from a class of rocks to which all geologists now assign an igneous origin, analogous to that of lava in existing volcanos. The theory divides itself into two parts; first, the formation of the cavities in which the agates are found; and, secondly, the filling of these cavities. With regard to the first, we have many analogies from modern lavas, and from processes of art, to guide us to a pretty satisfactory conclusion. Gases are evolved in great quantities by volcanos, and if produced at the same instant with a flow of lava, they would rise in bubbles in the melted mass; but in proportion as that became more viscid they would rise with greater difficulty to the surface, and when it consolidated would form cavities, the shape of which would be determined by the nature of the pressure of the surrounding viscid lava. To account for the filling up of the cavities three theories have been proposed: one supposes the siliceous matter to have been introduced in aqueous solution from without, and to have been gradually deposited in the cavities; another, that, in obedience to some peculiar laws of attraction, it has separated from the rest of the rock, and insinuated itself into the hollows left by the gases; and a third, that these hollows were filled by the sublimation of the silica and other materials from the rest of the mass by the action of heat. Each hypothesis is supported by particular cases, which it satisfactorily explains, but there are probably as many against as in favour of each; all of them imply conditions of chemical action different from anything of which we have had experience. We frequently find, it is true, masses of siliceous petrified wood in which hollows of the tree have been filled with agate, not to be distinguished from many nodules found in the trap rocks; and that the matter of the agate must have been introduced into the wood by aqueous infiltrations there can be no doubt. but, in this case, the whole substance of the sustaining mass, the wood, is penetrated by siliceous matter; and the difficulty of the theory of infiltration, in the case of the trap rocks, consists in the absence of any trace in the rock of the channel by which the solution of siliceous matter could have arrived at the cavity. The following section of an agate is a good example of the filling up of a cavity by infiltration, for it is evident that the siliceous matter, in whatever way it may have arrived, was introduced at the point *a*, and that there was a gradual deposition of it. Such examples would be more frequently met with, if there was anything in the external coat to tell us in what direction to slit the stone: this same specimen might have been cut in many directions without throwing any light upon its mode of formation, and the section we now see was an accidental cut in the right direction. An attentive consideration of the products of volcanos may lead to some satisfactory conclusion; for although agates have not been found in lavas, cavities in them are often partially or entirely filled with minerals distinct from any in the rest of the rock.



[Agate.]

Agates are often found as loose pebbles in the beds of rivers, or in gravel, but in those cases they have been derived from the disintegration of Amygdaloids, the base of which is very often subject to decomposition when exposed to air and moisture, and then the siliceous nodules fall out. They vary in size from that of millet seed to a foot in diameter; but one, two, and three inches in diameter are the most common.

The stones distinguished by mineralogists and lapidaries by the names of carnelian, calcedony, onyx, sardonyx, Mocha-stone, blood-stone, chrysoprase, and plasma, are so closely allied to agate, that they may be conveniently described under this head. In chemical composition they are not distinguishable, except in the case of the chrysoprase by its colouring matter.—CARNELIAN, so called because some kinds are of a flesh colour (*carnis*, Latin for flesh), is that variety of a uniform colour which is of most common occurrence: carnelians are never figured or striped. The colours are shades of red and yellow, the deep clear red being the rarest and most valuable. The great supply of carnelians is from Japan, where they exist in vast quantities, and they are also imported from Bombay, being collected in the province of Guzzerat; but the best, according to Niebuhr, come from the gulf of Cambay. Many of the antique gems are engraved in carnelian, and it is now much used for seals.—CALCEDONY, so called from having been early found at Calchedon (sometimes incorrectly written Chalcedon) in Bithynia, opposite Constantinople, is also of a uniform colour, generally of a milky-white or pale yellow, like turbid jelly, often with an internal wavy structure in the form of stalactites, and very generally with a peculiar mammillary surface. It is found in great abundance in the Faroe Islands, in Iceland, in Cornwall, and many places of Great Britain, as well as other countries; sometimes in large masses, from which cups and other vessels are formed. Pliny describes it as being found in the neighbourhood of Thebes in Egypt and as brought to Rome from Carthage.—ONYX. In this agate the siliceous particles are arranged in alternating horizontal layers of opaque white and translucent blue, grey, or brown; and because these have a resemblance to the marks on the human nail, the stone was called from the Greek word for nail, ὄνυξ (*onyx*). It was known to the ancients, and was employed by them, as it is now, for those beautiful gems called cameos, the figure being cut out of the opaque white, the dark part forming the ground, or the contrary. It is most valuable when the contrast of colours is strong, and when the layer is thick enough to give a high relief to the object to be engraved. In the royal library at Paris, there is an antique cameo cut out of an onyx with four layers, representing the apotheosis of Augustus, eleven inches by nine, which is supposed to be the finest in existence. Agates with an onyx structure are not uncommon, particularly among calcedonies, but the finest are brought from India. Cameos are sold at Rome which are made from a thick shell, having different coloured layers like an onyx.—SARDONYX is a variety of onyx which is supposed by some to have received its name from having been brought from Sardes, in Lydia. By others it has been said that the name comes from Sardo, the Greek name of Sardinia, there being some reason for thinking that the Carthaginians brought the stones from that island, and exported them during their occupation of it. In this the opaque white alternates with a rich deep orange brown of considerable translucency, and as this is of rare occurrence the sardonyx is of greater value. The finest are brought from the east, and some antique gems are formed of them.—MOCHA-STONES and MOSS AGATES are semitransparent calcedony, including various ramified forms, produced by iron, manganese, bitumen, and chlorite or green earth, but sometimes also, as has been proved by Daubenton and Mac Culloch, produced by the presence of real vegetable bodies, such as confervæ and mosses. The first are found in Guzzerat, but received their name from having been brought from Mocha, in Arabia.—BLOOD-STONE is a green agate coloured by chlorite, with numerous bright red spots like drops of blood; called also heliotrope and oriental jasper.—CHRYSOPRASE (from χρυσέος, *chruseos*, beautiful—and πράσον, *prason*, a leek) is a rare apple-green calcedony, found in Silesia, which owes its colour to the presence of the metal nickel;—and PLASMA is another scarce green semitransparent calcedony, but of a dark tint, which, in the opinion of Mac Culloch, is coloured by chlorite.

The great supply of the figured agates of commerce is from Oberstein, in the old Palatinate, about thirty miles east of Treves, and forty-five miles south of Coblenz. When they were used as buttons, knife-handles, &c., the trade was more extensive than at present. They are found in many parts of Scotland, especially at the Hill of Kinnoul, near Perth, where there is an amygdaloidal trap very full of fine specimens.

AGATHA'RCHIDES, a Greek writer on geography, a native of Cnidos, in Asia Minor. He lived in the time of Ptolemy VI., called Philometor, king of Egypt, (who reigned from B.C. 181 to 145,) and wrote numerous works on geography, and among them, one on the Erythræan Sea.

This work is now only known to us by extracts from the first and fifth books preserved by the Greek patriarch Photius, and some extracts in the compiler Diodorus. The works of Agatharchides doubtless contained a great deal of useful information, as we may fairly infer from the character of the fragments which remain. He is the earliest extant writer who attributes the annual rise of the Nile to the periodical rains in the upper regions of that river: (Diodorus, i., 41.) he has left a very minute and curious account of the mode of working the gold mines which lay between the Nile and the Red Sea; and he is the first extant writer who has mentioned the giraffe or camelopard (*Camelopardalis*), a singular quadruped peculiar to the African continent.

His remarks on the mode of hunting elephants, and on the inhabitants of the Red Sea coasts, are curious, and prove him to have been an inquisitive and careful writer.

What remains of Agatharchides may be seen in Hudson's *Minor Greek Geographers*, vol. i. The description of the gold mines is also to be found in Diodorus, iii., 12.

AGATHE'MERUS, a Greek writer who lived about the middle of the third century, and wrote a short treatise on general geography. The Greeks seem to have applied themselves for many centuries from the time of Herodotus downwards to geographical inquiry, and the nation was at no period deficient in men who laboured to give precision to the science, and to arrange all the known facts in systematic treatises. What we are now labouring to do at the present day, Agathemerus attempted for his age; though his work, as we now possess it, is merely a collection of short heads, or rather a kind of syllabus for a set of lectures. There are two books extant, of which the second is so confused and contradictory, that critics are disposed to assign it to a pupil of Agathemerus. The remains of Agathemerus may be seen in the second volume of Hudson's *Minor Geographers*. His first chapter contains a very short sketch of the history of Geography up to that time, with the names of those who had rendered the most eminent services to the science. His sixth chapter treats of the spherical figure of the earth, and what is now called the doctrine of the sphere, &c.

A'GATHIS is the generic name given by botanists to the trees, known in common language by the name of dammar and kawrie pines. These plants belong to the natural order Coniferæ, from all other species of which they are known, firstly, by their broad, lance-shaped, leathery leaves, the veins in which are numerous and nearly parallel, diverging a little at the base, and converging at the apex; and, secondly, by their seeds having a wing on one side instead of proceeding from the end.

The dammar pine (*agathis loranthifolia*), or the pinus dammara of Linnæus, is a large tree found on the very summits of the mountains of Amboyna, Ternate, and in many of the Molucca Islands. When young it has something of the aspect of a young cedar, the wood of which it is said to resemble. It is occasionally cultivated in the hot-houses of curious persons; but is of little value except for its resin, which, when pure, is white, clear, and brittle as glass, but in time becomes amber coloured.

Its timber is represented to be light and of inferior quality, wholly unfit for any situation exposed to wet, but answerng tolerably well for in-door purposes.

The kawrie pine (*agathis Australis*) grows only in New Zealand, in the forests of which it attains a considerable height, with a straight clean stem, which, from its lightness and toughness, has been found well calculated for the masts of ships. It is distinguished from the dammar pine by its narrower and more acute leaves, and by its more rapid mode of growth.

AGA'THOCLES, a Syracusan of low extraction, who became ruler of Syracuse, and great part of Sicily. The principal events in his life range between the years 330 and 289 B.C. He was the son of a potter, and is said to have worked at his father's trade. He was remarkable for beauty, strength, and capacity for enduring labour. In the outset of life, he belonged to a band of robbers; afterwards he served as a private soldier, and in that capacity gained the favour of a patron named Damas, who, being chosen general of Agrigentum, advanced him to the rank of chiliarch, or commander of a thousand men. On the death of Damas, who bequeathed his great wealth to his wife, Agathocles married the widow, and became one of the richest citizens of Syracuse. In this state of his fortune, he distinguished himself by his eloquence in the assembly of the people. But his conduct now was as seditious, as his former life had been profligate. Not content with wealth and popularity, he returned to his early habits, and committed continual acts of piracy against his countrymen.

The constitution of Syracuse, as established by Timoleon, was democratical: but, in the outset of Agathocles' political life, the aristocratical party, headed by Sosistratus, a personal enemy of his own, drove him into exile; and he retreated into Italy, where for some time he lived as a soldier of fortune. The restoration of democracy, and the banishment of Sosistratus and his friends, enabled him to return. The Carthaginians interfered in behalf of these new exiles; and a war ensued, in which Agathocles bore a distinguished part: but he was suspected of aiming at the tyranny, and was a second time compelled to quit Syracuse. In banishment, he collected an army which overawed both Carthage and Syracuse. After frequently defeating the troops of the former, he was recalled, under the pledge of an oath that he would attempt nothing against the democracy; and he was chosen general and protector, for the ostensible purpose of reconciling or putting down faction. Strong in the support of his own mercenary troops, united with some of the poorest and most desperate of the citizens, he proceeded to arrest and execute by military process the leaders of the aristocratical party, and gave up their adherents to the fury of his soldiery. In the massacre which took place, four thousand persons are said to have been murdered, and six thousand to have fled. The wives and children of the latter, those of them who were unable to accompany the fugitives, fell victims to the soldiery.

Agathocles now professed to have fulfilled his duty in clearing the city of the oligarchy, and declared his intention of retiring into private life: but he knew that the partners of his crimes could not maintain themselves without his countenance. At their call he consented to retain his office, on condition of holding it without a colleague (B.C. 317). He did not assume the state of a monarch, but exercised the powers of the most absolute king, with the title of *autocrator*, that is, *ruler according to his own pleasure*. He had risen as the champion of the poor; and he fulfilled his former promises by the abolition of debts and the distribution of lands. His whole career shows him to have been a bold bad man: but his government was able, and in quiet times not severe. It was not till the jealousy of the discerning rendered his situation difficult, or his unbounded ambition prompted him, that he incurred universal hatred by the renewal of sanguinary acts. He aimed at the dominion of the whole island; and succeeded in reducing all except the subjects of Carthage. But the Carthaginians made a strong effort to crush him, and they nearly succeeded. He was defeated with great slaughter (B.C. 309), his subjects nearly all revolted, and a siege being expected, he was obliged to shut himself up in Syracuse. In the following year he adopted the bold plan of carrying the war with his whole disposable force into Africa: but money was required for this purpose; and his contrivance for raising it seems borrowed from the habits of his early life. He offered to let those who feared the hardships of a siege retire from Syracuse, and he sent an armed force after them to plunder and murder those who availed themselves of the permission. By this atrocious act he at once gained supplies, and revenged himself upon his enemies.

On his first landing in Africa, the bold measure of Agathocles appeared to prosper. He burnt his ships, that his soldiers might have no opportunity of retreat, and no hope but in victory. He advanced inland, took several towns, defeated a powerful Carthaginian force sent to oppose him, and threw Carthage itself into great alarm. Meanwhile the Carthaginians prosecuted in vain the siege of Syracuse: but a new danger threatened the rule of Agathocles, from the powerful city of Agrigentum; which profited by the exhaustion both of Carthage and Syracuse to invite the Sicilians to shake off the dominion of both. Agathocles returned home in haste, and reduced some of the revolted cities. But the forces of the rest, united under the command of Deinocrates, a Syracusan, formerly general of the Greeks in the Carthaginian army, proved too strong for him. Moreover, his presence was again required in Africa, where the Carthaginians had repaired their losses, and regained their ascendancy. In this dilemma, he resorted to one of those infamous measures which disgrace his talents as a soldier and statesman. He saw the probability that the Syracusans might call in Deinocrates in his absence. A public festival took place shortly before his intended return to his African army. Being a man of popular manners, he affected to mix gaily in the mirth, and by plying the people with wine, encouraged them to open their hearts. By this insidious device, he ascertained who were his friends and who his enemies, and put to death the chief men of the latter, to the number of five hundred.

Whether in Sicily or Africa, the affairs of Agathocles never prospered in his absence. He was received on his return to the latter country by a mutiny among his troops, in consequence of his son Archagathus having been dilatory in furnishing their pay. On that occasion his popular eloquence saved him: he harangued the soldiery, saying that they must get their pay from the enemy, and that the booty, like the victory, should be in common. But the necessity of recovering the good will of his army betrayed him into imprudencies. He attacked the Carthaginians unadvisedly, and lost the battle, and a large portion of his men. He was compelled to retreat to his camp, where he saw that his rashness had set the soldiers against him, and he had reason to fear that they would renew the mutiny on account of the arrears of pay. He therefore fled in the night, accompanied by Archagathus. They were pursued, and the son was taken: the father, with better fortune, reached the ships in which he had returned from Sicily, and escaped. All his sons were murdered by the enraged soldiers, who then made terms with the Carthaginians. Agathocles avenged himself in kind on the murderers of his sons, by slaying the kindred of those who had served with him in Africa.

On his return to Sicily, he found that a large portion of the troops, and several of the cities, had gone over to Deinocrates, who himself aspired to sovereignty. He therefore made peace with the Carthaginians, and commenced a war against the exiles; whom he defeated, and treacherously slew to the number of seven thousand, after they had laid down their arms under assurance of safety. But he received Deinocrates with favour, and appointed him his general; nor did any enmity thenceforth occur between them, although both were equally ambitious and faithless. When all questions were settled between himself, the Carthaginians, and Deinocrates, Agathocles found it easy to reduce the revolted cities of Sicily. But he was not of a temper to be contented within the narrow boundaries of the island. He undertook an expedition into Italy against the Bruttii, laid the Lipari islands under contribution, and plundered their temples, but was obliged, by severe illness, to leave his main designs uncompleted. While in Italy, he made himself master of Crotona, and on the whole, with mingled prosperity and adversity, maintained the character of a mighty potentate, but a severe scourge of mankind. The final object of his ambition was to render Sicily a great naval power; and he had advanced far and successfully in the prosecution of this attempt, when he died, by one account, in consequence of a miserable and wasting illness,—by another, in consequence of poison administered by Mænon, one of his associates, in concert with his own grandson. His death took place in the year 289 B.C., at the age of seventy-two, after a reign of twenty-eight years.

AGATHODÆ'MON, of Alexandria, a map-maker, and apparently the author of the maps found in the oldest MSS. of the geography of Claudius Ptolemæus. There can be no doubt that Ptolemy's work was accompanied by maps; and indeed it is impossible that a tabular system of Geography, like his, could be without them. Maps on plates of copper are mentioned by Herodotus, who wrote above 500 years before Ptolemy. But, as we know nothing at all about the age of Agathodæmon, we cannot conclude, as some do, that he constructed Ptolemy's maps for him. It is more likely that he was a later editor or amender of them. In the Vienna and Venetian MSS., the following note in Greek is found at the end of the maps:—'According to the eight books of the geographical works of Claudius Ptolemæus, Agathodæmon of Alexandria delineated the whole earth.' It has been inferred from this that Agathodæmon was a contemporary of Ptolemy. But this does not seem to be quite conclusive. The shape which Agathodæmon gave to the different countries of the earth, maintained its ground on modern maps till the system of regular surveys became in use: and indeed till of late years, many features of our maps were only the traditional delineations of the old map-makers of Alexandria. [See Schoell, vol. ii. Heeren. *De fontibus Ptolemæi*. PTOLEMÆUS, CLAUDIUS.]

AGA'VE, in Botany, comprehends those plants which gardeners call American aloes. It consists of species producing clusters of long, stiff, fleshy leaves, collected in a circle at the top of a very short stem, and bearing flowers in a long terminal woody scape. With doryanthes and yucca it forms in the natural order Amaryllideæ an instance of high developement both in vegetation and fructification, compared with what is more generally characteristic of that tribe. If a crinum or an amaryllis had the stem elongated into a woody trunk, instead of being contracted into a short disk, lying at the bottom of a scaly bulb, the affinity between them and agave would at once be obvious.

There are many species of this genus, one only of which requires to be mentioned.

Agave Americana, or the American aloe, is a plant which, when full grown, has a short cylindrical woody stem, which is terminated by hard, fleshy, spiny, sharp-pointed, bluish green leaves, about six feet long, and altogether resembling those of the arborescent aloes. Each of these leaves will continue to exist for many years, so that but a small number have withered away by the time the plant has acquired its full maturity. It is commonly supposed that this occurs only at the end of one hundred years; but this, like many other popular opinions, is an error; the period at which the agave arrives at maturity varying, according to circumstances, from ten to fifty, or even seventy years. In hot or otherwise favourable climates, it grows rapidly and soon arrives at the term of its existence; but in colder regions, or under the care of the gardener, where it is frequently impracticable to attend to all the circumstances that accelerate its developement, it requires the longest period that has been assigned to it. Having acquired its full growth, it finally produces its gigantic flower stem, after which it perishes. This stem sometimes is as much as forty feet high, and is surrounded with a multitude of branches arranged in a pyramidal form, with perfect symmetry, and having on their points clusters of greenish yellow flowers, which continue to be produced for two or three months in succession. The native country of the American aloe is the whole of America within the tropics, from the plains nearly on a level with the sea, to stations upon the mountains at an elevation of between 9000 and 10,000 feet. From these regions it has been transferred to almost every other temperate country; and in Italy, Sicily, and Spain, it has already combined with the date and the palmetto to give a tropical appearance to European scenery.

[Agave.]

Independently of its beauty and curiosity, this plant is applicable to many useful purposes. Its sap may be made to flow by incisions in the stem, and furnishes a fermented liquor called by the Mexicans *pulque;* from this an agreeable ardent spirit, called *vino mercal*, is distilled. The fibres of its leaves form a coarse kind of thread; the dried flowering stems are an almost imperishable thatch; an extract of the leaves is made into balls, which will lather water like soap; the fresh leaves themselves cut into slices are occasionally given to cattle; and finally the centre of the flowering stem split longitudinally is by no means a bad substitute for a European razor strop, owing to minute particles of silica forming one of its constituents.

AGE. In legal acceptation, a person is said to be of age when he has passed those periods of his life at which he is supposed to have acquired sufficient discretion to enable him to do certain acts and enter into certain contracts, of which, before those periods have arrived, he is presumed to be incapable by reason of the immaturity of his understanding. The common law of England appoints certain specific times in the life of a man or woman before either is permitted to form contracts and incur municipal obligations. Thus, at the age of twelve years, a man may take the oath of allegiance; at fourteen, which for many purposes is considered the age of discretion, a person of either sex may choose a guardian, and may also, according to ancient authorities, be a witness in courts of justice; in the latter case, indeed, the rule is at the present day considerably relaxed, for children of much tenderer years are frequently permitted to give evidence, having been previously found competent upon examination to understand the nature of an oath. A female at the age of twelve years, and a male at the age of fourteen years, may make a valid will of personal estate, if proved to have had sufficient understanding at the time the will was made; but it is particularly provided by statute that no person under the age of twenty-one years shall make a will of lands. At the age of seventeen years, a person of either sex may be an executor or executrix.

With respect to matrimony, a woman may by law consent to marriage at twelve, and a man at fourteen years of age: though, by several statutes, parties under the age of twenty-one years cannot actually marry without the express consent of their respective parents or guardians. [See MARRIAGE.] The age of twenty-one years is, for most civil purposes, the full age both of a man and woman, at which period persons of either sex may enter into the entire possession of their real and personal estates, may manage and dispose of them at their discretion, and form contracts and engagements of all kinds upon their own account. A man cannot, however, be ordained a priest till twenty-four, nor be a bishop till thirty years of age.

With respect to criminal offences, the law of England regards the age of fourteen years as the age of discretion, at which the human mind is competent to distinguish between right and wrong; a person of either sex, therefore, who has attained that age is liable to prosecution and punishment for crimes. Under the age of seven years, a child is not in any case responsible by law for an offence committed by him; but, above that age, and under the age of fourteen years, if it clearly appears that a child is conscious of the nature and wickedness of the crime he commits, he may be tried and punished for it. A very singular instance is related by Mr. Justice Foster of a boy nine years old, who, under circumstances of malice and premeditation, had killed his companion, and hidden the dead body with much care and cunning, and who was tried for murder, and found guilty. The case was afterwards considered by the twelve judges, who thought that the circumstance of hiding the dead body proved the fact of consciousness of guilt, and therefore a capacity of distinguishing good from evil, inconsistent with the presumption of innocence arising from the tender age of the child; and they unanimously agreed that he was a proper subject for capital punishment. Foster's *Crown Cases*, p. 72. For more particular information on the whole of this subject, see INFANT.

AGE (Physiology). The term of human existence is divisible into distinct periods, each of which is distinguished by characters peculiar to itself. These characters, as far as they are external, are obvious to every one; but these external characters depend on internal states which are not obvious, and which have been discovered only by careful and persevering research. And the curious and interesting facts which those researches have disclosed, show that the different epochs into which life is divided are not arbitrary distinctions, but arise naturally out of constitutional differences in the system, dependent on different physiological conditions. The natural epochs of human life are six, namely, the period of infancy, childhood, boyhood or girlhood, adolescence, manhood or womanhood, and old age. The space of time included in the first four of these periods is fixed. In all persons after the lapse of a certain number of years, a definite change in the system uniformly takes place, in consequence of which the peculiarities which distinguish one period give place to those which characterise the succeeding. Thus the period of infancy, commencing at birth, extends to the end of the second year, the point of time at which the first dentition is completed: the period of childhood, commencing at the close of the second year, extends to the termination of the seventh or eighth year, the point of time at which the second dentition is completed: the period of boyhood or girlhood extends from the seventh or eighth year to the commencement of the age of puberty; that is, in general, in this country, in the female, from the twelfth to the fourteenth year, and for the male, from the fourteenth to the sixteenth year: the period of adolescence extends from the commencement of the period of puberty to the twentieth year of the female, and the twenty-fourth of the male: the period of womanhood extends from the twentieth, and of manhood, from the twenty-fourth year, to an age neither determined nor determinable with any degree of exactness; because the point of time at which mature age lapses into old age differs in every individual. It differs in many cases by a considerable number of years; and it differs according to primitive constitution, to the management of early infancy and childhood; according to regimen, exercise, occupation, physical and mental, and the several other circumstances included under the general term '*mode of life*.'

It is an observation familiar to every one, that some persons are older at fifty than others are at seventy, while instances every now and then occur in which an old man who reaches his hundredth year retains as great a degree of juvenility as the majority of those who attain to eighty. The period extending from the age of thirty or forty to that of extreme old age is then the only variable period in the term of human existence; the only period not fixed by limits which it is beyond the power of man materially to extend or abridge—a fact abounding with the most interesting practical suggestions.

The changes which take place in the system at the different epochs of life consist of changes in the physical condition of the body which it will be useful briefly to trace. These changes are intimately connected with, and are mainly dependent on the operation of a principle of consolidation, the influence of which, commencing at the first moment of existence, continues, without intermission, until the last moment of life. By this principle the body is changed, first from the state of a fluid into that of a solid; and next, from a soft and tender solid, into a solid which slowly, imperceptibly, but nevertheless uninterruptedly, increases in firmness and hardness.

When first the human embryo becomes distinctly visible, it is almost wholly fluid, consisting only of a soft, gelatinous pulp. In this gelatinous pulp solid substances are formed, which gradually increase and are fashioned into organs. These organs, in their rudimentary state, are soft and tender, but, in the progress of their development, constantly acquiring a greater number of solid particles, the cohesion of which progressively increases, the organs at length become dense and firm. As the soft solids augment in bulk and density, bony particles are deposited, sparingly at first and in detached masses, but accumulating by degrees: these, too, are at length fashioned into distinct osseous structures, which, extending in every direction, until they touch at every point, ultimately form the connected bony frame-work of the system. This bony fabric, like the soft solid, tender and yielding at first, becomes by degrees firm and resisting, fitted, as it is designed, to be the mechanical support of the body, and the defence of all the vital organs.

While the osseous system is thus extending in every direction, and everywhere increasing in compactness, the progressive consolidation of the body is equally manifest in all the tissues which are composed of the cellular membrane as well as in all those which possess a fibrous nature. The membranes, the ligaments, the tendons, the cartilages, gradually increase in firmness and elasticity, and proportionally diminish in flexibility and extensibility; and this change takes place, to a considerable extent, in the muscular fibre also, as is manifest from the toughness of the flesh of animals that are used for food, the degree of which every one knows is in proportion to the age of the animal; and from the conversion in extreme old age, in many parts of the body, of muscle into tendon, a denser material being substituted for the proper muscular fibre.

The steady and increasing operation of the principle of consolidation is still more strikingly manifest in the deposition, as age advances, of bony matter in tissues and organs to which it does not naturally belong, and the functions of which it immediately impairs and ultimately destroys. The textures in which these osseous depositions most commonly take place are membranes, tendons, cartilages, and the coverings of the viscera, but above all the coats of the blood-vessels, in consequence of which these highly flexible, elastic, and moveable organs become firm, rigid, and immoveable. But even when not converted into bone, several of these structures lose their flexibility with advancing age, and acquire an increasing degree of rigidity. This is strikingly manifest in all the parts of the apparatus of locomotion; in the joints, the mechanical contrivances for facilitating motion, and in the muscular fibre, the generator of the power by which motion is produced. The joints in old age are less pliable, less elastic, and more rigid than in youth; first, because the ligamentous and cartilaginous structures of which they are composed are more dense and firm; and secondly, because the oily matter which lubricates them, and which renders their motions easy and springy, is secreted in less quantity, and of inferior quality. Induration and proportionate deterioration take place then in the muscular fibre, the origin of the motive power, and in the joint the instrument by which the operation of the motive power is facilitated; and consequently the movements become slower, feebler, less steady, less certain, and less elastic.

But among all the changes induced in the body by the progress of age, none is more remarkable, or has a greater influence in diminishing the energy of the actions of the economy, and in causing the ultimate termination of all those actions in death, than the change that takes place in the minute blood-vessels. The ultimate divisions, or the smallest branches of the arteries and veins, the capillary vessels, as they are termed, are exceedingly abundant in the early periods of life, and are as active as they are numerous. The capillary arteries, the masons and architects of the system, by the agency of which all the structures are built up, and all the parts of the body grow and are developed, are numerous and active in the early stages of life, while they are carrying on and completing the organization of the frame. But from infancy to childhood, from childhood to youth, from youth to maturity, and from maturity to old age, the number and the activity of these vessels progressively diminish. Their coats, like other soft solids, increase in density and rigidity; their diameter contracts, many of them become completely impervious and ultimately disappear. The diameter of the capillary veins, on the contrary, enlarges. The coats of the veins, originally thinner than those of the arteries, instead of thickening and contracting, seem rather to grow thinner and more dilatable; hence their fulness, their prominence, their more tortuous course, and their greater capacity. At the two extreme periods of life the quantity of blood contained in these two sets of vessels is completely inverted. In infancy, the proportion of blood contained in the capillary arteries is greater than that contained in the capillary veins; in youth, this disproportion is diminished; at the period of maturity, the quantity in one set, nearly if not exactly balances that in the other; in advanced age, the preponderance is so great in the veins, that these vessels contain probably two-thirds of the entire mass. This difference in the distribution of the blood, at the different epochs of life, affords an explanation of several important phenomena connected with health and with disease. It shows, for example, why the body grows with so much rapidity at the early periods of life; why it remains stationary at the period of maturity; why it diminishes in bulk as age advances; why a plethoric state of the system affects the arteries in youth, the veins in age; why hæmorrhage, or a flow of blood, is apt to proceed in the young from the arteries, and in the aged from the veins; and so on.

The growth of the heart does not keep pace with the extension of the sanguiferous system, nor does its force increase with the augmenting density and resistance of the solids; hence there is a disturbance of the balance between the forces of propulsion and of extension which increases with advancing age; the diminished energy of the heart being indicated by the languor and slowness of the pulse, often not exceeding fifty pulsations in a minute, and sometimes sinking even lower than this. Hence, not only is less blood sent to the several organs, but that which is sent is less completely acted upon by the air in respiration on account of the diminished quantity which is transmitted through the pulmonary system of vessels; hence, the diminution of all the secretions, and hence, finally, the failure of the function of digestion, the source of the materials from which the blood itself is prepared and its losses replenished.

Upon the whole, then, it is clear that two great changes take place in the physical condition of the body in the progress of age; first, a gradual diminution in the quantity of the fluids, both of the entire mass contained in the system, and of the proportionate quantity contained in each organ: and, secondly, a progressive augmentation and induration of the solids. With this change in the physical condition of the body is uniformly combined a no less important change in its vital action. Progressively and proportionally as the solid parts increase in density and rigidity, they decrease in irritability and mobility; that is, they are less sensible to the influence of stimulants, and the power of contraction resident in the muscular fibre is less excitable. Now the knowledge of this two-fold modification of the system suggests practical applications of the greatest importance in the management of health, in the prevention of disease, in securing the attainment of perfect maturity, corporeal and mental, and consequently in promoting a general extension of the term of life.

In each of the epochs of life the health is peculiar; the diseases to which each is prone have also a specific character. A degree of energy in the vital actions, constituting a state of healthy vigour in one period, may be destructive violence in another; and a degree of intensity in the physical agent upon which those actions depend, merely sufficient to produce moderate excitement in one, may produce fatal stimulation in another.

It has been shown, that in the human infant by far the greater proportion of its body consists of fluids; and that this state of the system is characterized by an extreme degree of irritability and mobility. The capillary arteries, especially, are not only more numerous in this age than in any other, but they are also far more irritable; far more easily and dangerously excitable. And this is most particularly the case with the capillary arteries of the stomach and intestines; with those of the lungs; with those of the external skin; with those of the spinal cord and brain: and a consideration of the manner in which these vessels are acted on, for example, by aliment and by temperature, two agents which exert the most important influence over the health and life of the infant, will suffice to illustrate the value of knowledge of this kind.

The chief organ by which the function of digestion is performed is the mucous membrane that lines the stomach and intestines. Food, when in contact with the inner surface of this membrane, acts upon it as a stimulus and excites it to the performance of its office. Now so irritable is this membrane in the infant, that it can bear the contact only of one kind of aliment, namely, the milk formed by the mother. For this food, and only for this food, has nature specially adapted the organ, and the adaptation of this food to this organ is in its turn equally specific; and this relation cannot be disturbed or disregarded without preventing the due performance of the function, and thereby endangering health and life. Even the blandest substances, the milk of other animals, which, at a more advanced age, can be readily converted into nutriment, over excites the delicate digestive organ of the infant, producing first grievous irritation in the system, and, ultimately, exhaustion and death. From large experience it is found, that of the infants who are deprived of this their natural nourishment, not more than one in seven reaches the more advanced periods of life. Without doubt circumstances may justify a mother in abandoning her infant, but she ought, at least, to know the extent of the sacrifice she makes when she withholds from it the only food by which it can live; she ought to be fully aware that by this act she does abandon it.

Cold acts upon the lining membrane of the air-passages of the lungs, as injuriously as improper diet upon the mucous surface of the alimentary canal; and it also acts most energetically and deleteriously upon the whole external surface of the skin. The new-born infant has been kept for months in a constant and unvaried warmth. Both its external and its internal surfaces have been completely shielded from the contact of foreign bodies. But at the moment of birth its condition is wholly changed; both surfaces are fully exposed to agents, to the influence of which it is acutely sensitive. Air surrounds the external skin and rushes to the lung and expands it; cold acts simultaneously and powerfully on both organs. If the cold be severe, or if the changes of temperature be great and rapid, inflammation is sure to be excited in the *lung;* and this is one of the chief sources of the mortality of infancy. The injurious action of cold upon the *external* surface is two-fold; first, upon the vessels, and nerves of the skin; and, secondly, upon the vessels, and nerves of the internal organs; for the cold, constringing the external vessels, causes the blood diffused over this extended surface to rush to the internal parts, and especially to the brain, in which it often produces dangerous and fatal disease. The mother should never forget that a degree of cold which the child can bear with impunity may excite a mortal inflammation in the infant; and that an intensity of cold which may only invigorate the adult may kill the child. Were an accurate record kept of the number of children annually destroyed in England by improper exposure to cold, the sum would fill the country with dismay. The proper management of the period of infancy consists essentially in causing the infant to subsist on the milk of the mother only, at least during the first months; in keeping it in an equal and moderately warm temperature; in surrounding it by night as well as by day, when asleep as well as when awake, by a large bulk of fresh air; in frequently washing the entire surface of its body first with warm, then with tepid, and towards the latter months of the period, in perfectly cold water, followed immediately by vigorous friction.

There is one caution in relation to medicine which cannot be too frequently kept in view. The same state of the system which renders the infant so susceptible to the influence of ordinary physical agents, renders it at least equally susceptible to the influence of irritant drugs; and especially of those which act primarily on the mucous surface of the alimentary canal, or on the nervous system. The regulation of the bowels by aperient medicine is often necessary; but a tea-spoonful of castor oil, or from four to six grains of magnesia, is all that the mother or the nurse should venture to give unless under the superintendence of a medical friend. The aperients often given are far too irritating; while of an opposite class of medicines it may be truly said, that every preparation of opium, even in the very minutest dose, is, in the early period of infancy, highly dangerous. Opiates act on the nervous system of the infant most energetically and banefully, and many is the new-born infant whose life is suddenly cut short by quack medicines, soothing as they are called, (and soothing indeed they are!) which often contain a concentrated dose of a powerful narcotic, and which, according to the dose, excites either an inflammatory action of the capillaries of the brain, or an accumulation of blood in the cerebral vessels, one or other of which co-operating with the irritable state of the system, for the quieting of which the opiate was given, produces the quiet of death.

From the seventh month to the end of the second year, the consolidation and development of all the tissues and organs proceed with rapidity. The process of ossification advances: the soft solids grow firmer: the muscles enlarge in bulk and increase in strength: the brain especially becomes more developed, and its functions more active and more extended: consequently, sensation not only increases in acuteness and exactness, but embraces a wider range; hence perception becomes more perfect; the phenomena of mind appear; speech commences; affection is generated; passion induced; moral habits, good or bad, acquired, each of which events introduces into the economy a new power which ever afterwards exerts over it a prodigious influence for good or for evil, for pleasure or for pain, for health or for sickness.

As infancy passes into childhood, the brain, the spinal cord, the bones, the muscles, and the other soft solids, progressively acquire bulk, cohesion, firmness, and strength. All the capillaries of the system still continue exceedingly active and highly irritable. For the support of their action a large supply of nutritious food is indispensable. There is scarcely an organ that is not still to be completed, and the magnitude of which is not to be augmented. Aliment is the material by which these results are to be effected, and the consequences of privation at this period are truly deplorable. Not only is the growth of the body checked for a time, but the physical and mental constitutions are irreparably injured. From the beginning to the end of this period every effort should be directed to the development and invigoration of the physical, and the formation and direction of the moral powers; as yet the development of the intellectual is of little consequence. The health, the strength, the longevity, the physical, the intellectual, the moral qualities, the usefulness or the mischievousness, the happiness or the misery of the future man, depend essentially on the management of these two periods of human existence. For this reason we have endeavoured to direct attention to their paramount importance, and to the value of that knowledge which teaches in what their proper management consists. We shall have other occasions to return to the subject, and to state more in detail the regimen proper to these earlier, as well as to the more advanced stages of human life. In the mean time we earnestly intreat the attention of WOMEN to subjects of this class. The health and life, and what is of much more importance, the virtue and happiness of their children are far more deeply involved in the soundness of the knowledge they acquire on subjects of this kind, than they have hitherto been taught to believe.

AGE OF LIFE. [See MORTALITY.]

AGE OF ANIMALS. It is often a matter of great importance to possess some means of determining the age of organized bodies, both in the animal and vegetable kingdoms. It is to be regretted, however, that for our guidance in these matters we possess but few general principles derived from well-regulated observations and experiments. As far as regards animals, indeed, it has been said, that the duration of life is generally between seven and eight times the period which elapses from birth till they become adult; but this rule, besides being vague and indefinite, is quite useless and inapplicable in practice, because it affords no scale of gradation which would enable us to ascertain the precise age of individuals, the only inquiry of real importance or of practical application to the interests of society. More certain and scientific principles are derived from observing the growth and decay of the teeth; and if we were acquainted with the various phenomena which attend the development of these organs in all quadrupeds, there is no doubt but that we should be enabled to obtain general and, in a great measure, certain rules, not only applicable to individual cases, but likewise to the speculative philosophical problem of the duration of life in each separate species. At present, however, we do not possess a series of observations sufficiently extensive to enable us to solve this problem generally; and we shall, therefore, confine ourselves to the few individual cases in which it has been determined, and which relate only to the most important domestic animals.

The age of the horse is known principally by the appearance of the incisive teeth, or, as they are technically called, the nippers. Of these there are six in each jaw, broad, thin, and trenchant in the foal, but with flat crowns marked in the centre with a hollow disk in the adult animal. The foal or milk teeth appear fifteen days after birth; at the age of two years and a half the middle pair drop and are replaced by the corresponding permanent teeth; at three years and a half the two next, one on each side, fall and are likewise replaced; and at the age of four years and a half the two external incisors of the first set drop and give room to the corresponding pair of permanent teeth. All these permanent nippers, as we have already observed, are flattened on the crown or upper surface, and marked in the centre with a circular pit or hollow, which is gradually defaced in proportion as the tooth wears down to a level with its bottom. By the degree of this detrition or wearing of the teeth, the age of the animal is determined, till the eighth year, at which period the marks are generally effaced; but it is to be observed that the external incisors, as appearing a year or two after the intermediate, preserve their original form proportionally for a longer period. After the eighth year the age of the horse may be still determined for a few years longer by the appearance and comparative length of the canine teeth or tushes. These, it is true, are sometimes wanting, particularly in the lower jaw, and in mares are rarely developed at all. Those of the under jaw appear at the age of three years and a half, and the upper at four; till six they are sharp-pointed, and at ten they appear blunt and long, because the gums begin about that period to recede from their roots, leaving them naked and exposed; but after this period there are no further means of judging of the horse's age, excepting from the comparative size, bluntness, and discoloured appearance of the tushes. The duration of the horse's life seldom surpasses thirty years, though there have been instances recorded in which it is said to have extended to double that period.

In horned cattle the age is indicated more readily by the growth of these instruments than by the detrition and succession of the teeth. The deer kind, which shed their horns annually, and in which, with the single exception of the rein-deer, they are confined to the male sex, have them at first in the form of simple prickets without any branches or antlers; but each succeeding year of their lives adds one or more branches, according to the species, up to a certain fixed period, beyond which the age of the animal can only be guessed at from the size of the horns and the thickness of the burr or knob at their roots, which connects them with the skull. In the common stag, the pricket or first horn falls during the second year of the animal's life, and is replaced by one with a single antler, and called, from this circumstance, the fork. This again falls during the third year, and is replaced by the third horn, which, as well as the fourth or following pair, have commonly three or four, and sometimes even five branches. In the same manner the number of antlers goes on increasing till the eighth year of the animal's life, beyond which period they follow no fixed rule, though they still continue to increase in number, particularly towards the summit of the horn, where they are often grouped in the form of a coronet, and in this state they are called royal antlers. The fallow-deer, the roe-buck, and others of this genus, present similar phenomena; the number of the antlers increases according to certain fixed rules up to a certain period, beyond which the age can only be determined, as in the stag, by the comparative size and development of the burr and shaft, or that part of the horn from which the antlers grow. In the former species, the prickets of the second year are replaced by horns bearing two antlers, and already beginning to assume the palmated form which distinguishes them from the antlers of most other deer. Afterwards this palm increases in breadth, and assumes an indented form on the superior and posterior borders: these are the fourth horns, which are shed in the animal's fifth year, and are replaced by others in which the palm is cloven or subdivided irregularly into distinct parts, so that the horns of old animals frequently assume a great diversity and singularity of form. From this period the horns begin to shrink in size, and are even said to end in becoming simple prickets as in the first year.

The horns of oxen, sheep, goats, and antelopes, which are hollow and permanent, are of a very different form, and grow in a different manner, from those of the deer kind. These, as is well known, consist of a hollow sheath of horn, which covers a bony core or process of the skull, and grows from the root, where it receives each year an additional knob or ring, the number of which is a sure indication of the animal's age. The growth of the horns in these animals is by no means uniform through the whole year, but the increase, at least in temperate climates, takes place in spring, after which there is no further addition till the following season. In the cow kind, the horns appear to grow uniformly during the first three years of the animal's life; consequently, up to that age they are perfectly smooth and without wrinkles, but afterwards each succeeding year adds a ring to the root of the horn, so that the age is determined by allowing three years for the point or smooth part of the horn and one for each of the rings. In sheep and goats the smooth or top part counts but for one year, as the horns of these animals show their first knob or ring in the second year of their age; in the antelopes they probably follow the same rule, though we have very little knowledge of their growth and development in these animals.

There are very few instances in which the age of animals belonging to other classes can be determined by any general rules. In birds it may be sometimes done by observing the form and wear of the bill; and some pretend to distinguish the age of fishes by the appearance of their scales, but their methods are founded upon mere hypothesis and entitled to no confidence. The age of the whale is known by the size and number of laminæ of whale-bone, which increase yearly, and, if observation can be relied upon, would sometimes indicate an age of three or four hundred years for these animals.

AGE OF TREES. Every thing connected with the growth of timber-trees, their duration, and the causes which conduce to their decay, bears so directly upon points not only of general interest, but of great practical importance, that we have thought it advisable to devote an article to its separate consideration.

Plants, like animals, are subject to the laws of mortality, and, in many cases, have the period of their existence determined by nature with as much exactness as that of an insect. But at the same time, not only their structure, but their vital actions are so peculiar, that little analogy can, in any case, be traced between the more perfect of them and the animal world, and a very large proportion appear to be capable of an almost indefinite period of existence, if it were not for accidents and disease, independent of old age.

It is chiefly to annual and biennial plants that what may be called a precise period of duration is fixed; a period determined by the production of their fruit, and not capable of being prolonged beyond that event, except by artificial means. Dismissing all such from our consideration, the remainder of the more perfect part of the vegetable kingdom, whether herbaceous, or shrubby, or arborescent, consist of plants which may be classed under two principal modes of growth.

One of these modes is to increase, when young, in diameter, rather than in length, until a certain magnitude is obtained, and then to shoot up a stem, the diameter of which is never materially altered. The addition of new matter to a trunk of this kind takes place by the insinuation of longitudinal fibres into the *inside* of the wood near the centre; on which account such trees are called ENDOGENOUS; they also bear the name of *Monocotyledons.*

The other mode is, from the beginning, to increase simultaneously in length and diameter, but principally in length. The addition of new matter to a trunk of this kind takes place by the insinuation of longitudinal fibres into a space beneath the bark, and on the *outside* of the wood near the circumference; on which account such trees are called EXOGENOUS; they also bear the name of *Dicotyledons.*

Some modifications of these two modes are known to exist, but it would only confuse the subject if they were adverted to on this occasion.

To the first of these classes belongs the palm-tribe, and some other tropical trees. There is scarcely any well-attested evidence of these plants ever acquiring any considerable age. It has, indeed, been supposed, that certain Brazilian cocoa-nut palms may be from 600 to 700 years old, and that others probably attain to the age of something more than 300 years. But the method of computing the age of palms, which is either by the number of rings externally visible upon their rind between the base and the summit of the stem, or by comparing the oldest specimens, the age of which is unknown, with young trees of a known age, is entirely conjectural, and not founded upon sound physiological considerations; besides which, the date-palm, which is best known to Europeans, does not at all justify the opinion that palms attain a great age; the Arabs do not assign it a greater longevity than from two to three centuries. Independently of this, the mode of growth of such endogenous trees as palms seems to preclude the possibility of their existing beyond a definite period of no great extent. The diameter to which their trunk finally attains is very nearly gained before they begin to lengthen, and afterwards all the new woody matter, which every successive leaf *necessarily* produces during its developement, is insinuated into the centre. The consequence of this is, that the woody matter previously existing in the centre is displaced and forced outwards towards the circumference; as this action is constantly in progress, the circumference, which in the beginning was soft, becomes gradually harder and harder, by the pressure from within outwards, till at last it is not susceptible of any further compression. After this has occurred, the central parts will gradually solidify by the incessant introduction by the leaves of new wood which thrusts outwards the older wood, till at last the whole stem must become equally hard, and no longer capable of giving way for the reception of new matter; *for what has once been formed always remains, and is never absorbed by surrounding parts.* As soon as this occurs, and occur it must in trunks which rarely exceed a foot, and, perhaps, never a foot and half in diameter, the tree will perish; because its vitality is dependent upon the full action of all the functions of the leaves, and the cessation of one is the cessation of all. It is for these reasons that we feel justified in considering it probable that endogenous trees, such as palms, attain no considerable age, and that the duration of their existence must be absolutely fixed in each species by the power they may respectively have of permitting the descent of woody matter down their centre.

But in exogenous trees, it is quite the reverse: to their existence no limited duration can be assigned; on the contrary, there is nothing physically impossible in the notion that some individuals now existing may even have been silent witnesses of the Noachian deluge. In consequence, first, of the new woody matter which is constantly formed by the leaves of such trees being insinuated beneath the bark near the circumference of their trunk, and, secondly, of the bark itself being capable of indefinite distention, no compression is exercised by the new parts upon those previously formed; on the contrary, the bark is incessantly giving way to make room for the wood beneath it, while the latter is, in consequence, only glued, as it were, to what succeeds it, without its own vital powers being in any degree impaired by compression. It is in the newly-formed wood that the greatest degree of vitality resides: in the old wood near the centre life in time becomes extinct; but as each successive layer possesses an existence in a great degree independent of that which preceded it, the death of the central part of an exogenous tree is by no means connected with any diminution of vitality in the circumference. Hence it is that hollow trees are often so healthy; and that trees in the most vigorous state are often found decayed at the heart without any external sign, as timber-merchants frequently discover to their cost. The manner of growth in exogenous trees being such as has been just described, they may be compared to a succession of hollow cylinders increasing gradually in diameter and sheathing one another. This being the case, and the last cylinder having its own independent vitality, it will be apparent that, under circumstances constantly favourable to growth, individuals of this kind may continue to exist to the end of time; for there is no conceivable manner in which their death can be brought about in the absence of accidents; among which would, of course, be classed starvation, arising from the destruction of nutriment in the soil where they grow, and suffocation caused by the obstruction of their respiration, whether by the absence of light or the exclusion of air.

This it is which explains the extreme old age which some trees certainly attain. Of the many remarkable cases upon record, the following are among the more interesting.

At Ellerslie, the birth-place of Wallace, three miles to the south-west of Paisley, stands an oak, in the branches of which tradition relates that celebrated chieftain to have concealed himself with three hundred of his followers. However improbable the latter circumstance may be, it is at least certain that the tree may well have been a remarkable object even at the period assigned to it by tradition, namely, in the beginning of the fourteenth century, and if so, this individual must be at least 700 years old. Its branches are said to have once covered a Scotch acre of ground; but its historical interest has rendered it a prey to the curiosity of the stranger, and its limbs have gradually disappeared till little remains except its trunk.

[The Wallace Oak.]

Many other cases of oaks of extreme old age are recorded, some of which have been estimated at 1500 or 1600 years.

At Trons, in the Grisons, there existed, in 1798, a lime tree which was a celebrated plant in the year 1424, and which, when last measured, was fifty-one feet in circumference. The age of this specimen could not have been less than 580 years.

In the year 1776, there existed in the Palace Garden of Granada some famous cypresses called *Cupresos da la Sultana*, in consequence of some event that occurred in the time of the Moorish kings, at which time they formed a cypress grove. These are thought to have been at least 800 or 900 years old.

The famous sweet-chestnut trees on Mount Ætna, especially those called the *Castagna de' Cento Cavalli*, 180 feet in circumference at the bottom of the trunk, *de Sta. Agatha*, seventy feet in circumference, and *della Nave*, sixty-four feet in circumference, must be of high antiquity; but nothing precise is known upon this point, and it is almost certain that the first mentioned has been in reality formed of five or six trunks grown together.

Equally unknown is the age of an immense oriental plane tree now growing in the valley of Bujukdere near Constantinople, which is 150 feet in circumference, with an internal cavity eighty feet in circumference.

The walnut sometimes attains a prodigious size, consequently a great age. Scamozzi, an Italian architect, mentions his having seen at St. Nicolas, in Lorraine, a single plank of its wood twenty-five feet wide, upon which the Emperor Frederick III. had given a sumptuous feast.

Eight olive trees still exist in the Garden of Olives at Jerusalem, which can be proved by historical documents to have existed anterior to the taking of the city by the Turks, and consequently to be at least 800 years old.

Of ancient yews several authentic instances can be named. At Ankerwyke House, near Staines, is a yew older than the meeting of the English barons at Runnymede, when they compelled King John to grant the Magna Charta.

[The Ankerwyke Yew.]

This tree, at 3 feet from the ground, measures 9 feet 3 inches in diameter; and its branches overshadow a circle of 207 feet in circumference. The yews of Fountain's Abbey, in Yorkshire, are probably more than 1200 years old, and to others an age of from 2500 to 3000 years has been assigned.

Even this degree of antiquity is, however, much less than that of the Baobab trees of Africa, estimated by Adanson at 5150 years; and the deciduous cypress of Chapultepec in Mexico, which the younger De Candolle considers still older.

The way in which the age of some of these specimens has been computed is twofold. firstly, by comparing them with other old specimens, the rate of growth of which is known; and secondly, by cutting out a portion of their circumference and counting the number of concentric rings that are visible. For in exogenous trees the woody cylinder of one year is divided from the succeeding one by a denser substance, which marks distinctly the line of separation of the two years.

The first of these methods is sufficiently correct to give at least an approximation to the truth, and the latter would be absolutely correct, if one could be quite sure that observers provided against all possible causes of error. But it has been shown, (see Dr. Lindley's *Introduction to Botany*, p. 66,) that in consequence of the extreme inequality in thickness of the annual layers of wood on opposite sides of a stem, a person who judged of the whole age of a tree by the examination of the layers of the stunted side only, would commit errors to the amount of sixty per cent. and more. It is by no means impossible that the great age assigned to the deciduous cypress and the Baobab may be connected with an error of this nature.

In the course of the inquiry into the method of computing the age of ancient trees, a discovery has been made of some importance to timber growers, inasmuch as it shows that those who plant for profit alone should not allow their trees to grow beyond a certain number of years, varying according to species: for it has been found that so far are exogenous trees from continuing always to increase in diameter at the same rate, that every kind diminishes in its rate of growth after a certain age;—the oak, for example, between its fortieth and its sixtieth year, the elm after its fiftieth, the spruce fir after its fortieth, and the yew probably after its sixtieth. With reference to this subject, Professor De Candolle has constructed a table of rate of growth, which we subjoin.

Table of the rate of Increase in Diameter of certain Exogenous Trees, expressed in lines.

Yrs. Yrs.	Quercus pedunculata, 130 years old.	Quercus sessiliflora, 210 years old.	Quercus sessiliflora, 333 years old.	Larch Fir, 255 years old.	Elm, 335 years old.	Spruce Fir, 120 years old.	Yew, 71 years old.
1 to 10	54	10	18	48	16	41	8
10 . 20	64	16	33	61	44	54	11¼
20 . 30	54	22¼	39½	58	58½	52	12
30 . 40	60	12	38	72	72	45	10¼
40 . 50	48	13¼	23	46	88	35½	7
50 . 60	44	14	12¼	57	74	36	12¼
60 . 70	56	10⅔	9	46	78¼	18	8
70 . 80	44	11	9½	29	66	17	
80 . 90	32	9¼	8½	30	59	13	
90 . 100	32	9¼	8	24	45	13	
100 . 110	30	9¼	7½	32	30	22	
110 . 120	36	9	8½	26	30	22	
120 . 130	30	9	8	20½	24		
130 . 140		9¼	10	22	24		
140 . 150		10	8	23	18		
150 . 160		8¼	8½	21	19		
160 . 170		9	9	20	17½		
170 . 180		10	8	19	23		
180 . 190		9	8	18	30		
190 . 200		9	7	21	34		
200 . 210		9	8	22	34		
210 . 220			7	22½	26		
220 . 230			6	21	36		
230 . 240			8	22	28		
240 . 250			8	20¼	26		
250 . 260			7½		24		
260 . 270			8		17½		
270 . 280			8		26		
280 . 290			8½		28		
290 . 300			8½		29		
300 . 310			9		16		
310 . 320			8		16½		
320 . 330			8		21		

It is very much to be wished that observations of this kind should be multiplied, as they would probably lead to some very important conclusions, and, at all events, would throw light upon a part of botany that is at present very obscure. It, however, would be of little use to find the diametrical measurement of trees less than 100 years old.

AGES OF THE WORLD. In the mythology of the Greek and Roman poets, the history of the world was divided into four ages, the golden, the silver, the brazen, and the iron; as for instance, Hesiod in his poem entitled *Works and Days*, and by Ovid, in his *Metamorphoses*. The golden age, when Saturn reigned, is represented as having been that of perfect innocence and happiness; from which the others have gradually degenerated more and more,—the iron age, or that which now subsists, being the most wicked and miserable of all. Sometimes these ages are spoken of as merely so many successive periods in the history of Italy. Saturn having been driven out of heaven by his son Jupiter, is supposed to have sought an asylum in that country, where, in return for the protection he received from King Janus, he taught him and his people agriculture, and the other arts of cultivated life. According to this latter mode of telling the story, it will be observed, the golden age is represented as consisting in the triumph of civilization over previous barbarism; whereas the other version seems intended to indicate that the primeval state of man was that in which he enjoyed the greatest felicity and purity, and that he has been rather corrupted than improved by what is called civilization. The two statements, therefore, may be taken as expressing two opposite theories or opinions which have divided speculators upon this subject down even to our own day. The disagreement among the fabulists, however, is only with regard to the original condition of man; it seems to have been admitted on both sides that a gradual declension both of the happiness and virtue of the world has been going on ever since the age of gold. The golden age is that of which the most complete pictures have been drawn; indeed it may be said to be the only one of the four of which the description is at all distinct. The age of iron was deemed to have commenced long before Hesiod's day, who lived probably at least twenty-six hundred years ago; it was, in fact, merely a general name for the existing order of things, as distinguished from some imaginary previous state. But neither that immediately preceding state, designated the age of brass, nor its forerunner, the age of silver, is to be found discriminated in the poetic painting by anything more than some slight varieties of shade. Of the golden age, when universal harmony prevailed throughout the living creation, and the bounteous earth yielded her increase untilled, we have various descriptions from the pens of modern as well as of ancient poets. The reader of Italian poetry will recollect in particular the celebrated chorus at the end of the first act of Tasso's *Aminta*, and the imitation of it at the end of the fourth act of Guarini's *Pastor Fido*.

AGENEIO'SES, in Ichthyology, a genus of abdominal *Malacopterygious* fishes, separated from the silures by Lacepede, and containing two species, both from the fresh-water lakes and rivers of Surinam.

AGENT. An agent is a person authorized by another to do acts, or make engagements in his name; and the person who so authorizes him is called the principal.

An agent cannot be appointed to bind his principal by deed, otherwise than by deed; nor can an agent be appointed by a corporation aggregate (unless it be for certain ordinary and inferior purposes) otherwise than by deed: and for the purpose of making leases and other acts specified in the first, second, and third sections of the statute of frauds, the authority of the agent is required to be in writing. In all other cases no particular form is necessary: in commercial affairs agents are most usually commissioned by a letter of orders, or simply by a retainer; but a verbal appointment is quite sufficient; and even the mere fact of one person's being employed to do any business whatever for another will create between the parties the relation of principal and agent.

An agent's authority (unless it is an authority coupled with an interest, such as a power of attorney granted as a security for a debt) may, in general, be revoked by the principal at any time. It also ceases upon his death or bankruptcy.

There are numberless kinds of agents, answering to the endless diversity of modes in which one person may be employed to act for another. Many of these are known by specific names, such as bailiffs, factors, brokers, &c. The particular rights, duties, and liabilities of each of these will be found under their respective heads. The object of this article is to state the general principles of law, which are applicable equally to all.

Whenever the relation of principal and agent exists between two persons, the law fixes upon them certain rights and duties as the result of such relation; or, (as the same thing is sometimes differently expressed,) the law implies a certain contract between the parties, and points out what shall be the consequences of that contract with respect to third persons.

In the first place, we shall explain what are the rights and duties with respect to one another, resulting from the relation of principal and agent.

And secondly, what are the rights and duties with respect to third persons, resulting from the relation of principal and agent, or, in other words, what is the effect of the contract implied by law between them, as far as regards third persons.

I. First, of the relative rights and duties of principal and agent.

1. The first great duty of an agent is to use faithfully, and in its full extent, the authority which has been given him.

An agent's authority is said to be limited, when he is bound by precise instructions; and unlimited, when he is not so bound. Where his authority is limited, an agent is bound to adhere strictly to his instructions in every particular. Thus, if instructed to sell, he has no right to barter; nor if instructed to sell at a certain price, is he authorized to take less.

When the agent's authority is not limited by precise instructions, his duty is to act in conformity with what may reasonably be presumed to be the intentions of his employer. And in the absence of all other means of ascertaining what these intentions are, he is to act for the interest of his principal, according to the discretion which may be expected from a prudent man in the management of his own business. Thus, if he is authorized to sell, and no price is limited by his instructions, it should be his endeavour to obtain the best price which the goods are fairly worth. If there have been other transactions of the same nature between the parties, it is to be presumed that the principal intends that the same mode of dealing should be pursued, which, in former cases, he had either prescribed or approved of.

In mercantile transactions it is a rule of universal application, that, in the absence of other instructions, the principal must be presumed to intend that his agent should follow the common usage of the particular business in which he is employed. This, therefore, is the course which it is the agent's duty to pursue; and he will, in all cases, be justified in so doing, even though, under the particular circumstances, he might have acted otherwise to the greater advantage of his principal.

Thus a factor of common right is to sell for ready money, but if he is employed in a dealing or trade where the usage is to sell upon credit, he will be authorized in selling to a person of good credit, and giving such time as is reasonable and customary.

An authority is always to be so construed as to include all necessary or usual means of executing it with effect. An agent is, therefore, authorized to do all such subordinate acts as are either requisite by law, in order to the due performance of the principal objects of its instructions, or are necessary to effect it in the best and most convenient manner, or are usually incidental to it in the ordinary course of business.

Thus it is the duty of an agent employed in the receipt or dispatch of goods, to take care that the custom-house duties are satisfied, and the proper entries made; and he will be authorized in making any advances, as well for such incidental charges as warehouse-room, as for any other expense necessarily incurred for the preservation of the property.

2. The next duty of an agent is, in the execution of his trust, to exercise a proper degree of diligence and skill. He is required to use, in the concerns of his employer, the same diligence and care which would be expected from a prudent man in the management of his own business; and he is bound, without any particular instructions, to take every precaution ordinarily used for the safety and improvement of property intrusted to him.

He is also expected, in common with every professional man who holds himself out as ready, for a proportionate remuneration, to transact any particular kind of business for another,—to possess and exercise such a competent degree of skill and knowledge, as may in ordinary cases be adequate to the accomplishment of the service undertaken.

If an agent does an act which is not warranted by his authority, either express or implied, or if he does an act within his authority, but with such gross negligence or unskilfulness that no benefit can accrue from it, the principal may, at his option, either reject or adopt what he has done. But if he rejects it, he must do so decisively from the first, and give his agent notice thereof within reasonable time; for if he tacitly acquiesce in what has been done, and still more if he in any way act upon it, he will be presumed to have adopted it.

Thus, if an agent puts out his employer's money at interest without his authority, or if a factor, employed to purchase, deviates from his instructions in price, quality, or kind; or if he purchases goods which he might at the time have discovered to be unmarketable, the principal may disavow the transaction; but if, in the first cases, he knowingly receives the interest, or, in either of the others, if he deals with the property as his own, he adopts the act of the agent, and takes upon himself all responsibility for the consequences.

But if he does not afterwards either expressly or impliedly adopt the act, the whole hazard of it lies with the agent, even though he did it *bonâ fide*, and for the interest of his employer. Any profit or advantage that may accrue from it he must account for to his principal; and if loss ensues, he is bound to make it good to him. An agent is likewise answerable to his principal for all damage occasioned by his negligence or unskilfulness. This responsibility applies in all cases, not only to the immediate consequences of his misconduct or neglect, but likewise to all such losses, as, but for his previous misconduct or neglect, would not have occurred: such, for instance, as the destruction of goods by fire in a place where he had improperly suffered them to remain; but it does not extend to such losses by fire, robbery, or otherwise, as are purely accidental, and happen by no default of his own; and his responsibility extends to the whole amount of the damage suffered by the principal, either by direct injury occasioned to his own property, or by his being obliged to make reparation to others.

If an agent's negligence is so gross, or his deviation from his authority so great, as to amount to a breach of the duty created in law, by the relation of principal and agent, or (which is the same thing) to a breach of the contract, which (if none exist) the law, as we have before seen, will imply between them, the agent is liable to an action for such breach of duty or of contract, whether any injury has been sustained by it or not; but if no injury has been in fact sustained, the damages will be merely nominal.

3. The third general duty of an agent is to keep a clear and regular account of his dealings on behalf of his principal, including as well what he has received as what he has paid; to communicate the results from time to time; and to account when called upon, without suppression, concealment, or overcharge.

An agent is not in general accountable for money until he has actually received it, unless he has, by improper credit, or by other misconduct or neglect, occasioned a delay of payment. But an agent acting under a commission *Del credere*, that is, one who has undertaken to be surety to his principal for the solvency of the persons he deals with, is, in their default, accountable for the debt; and in all cases where an agent has actually received money on behalf of his principal, he is bound to take care of it according to the general rules which regulate his conduct; and if any loss is occasioned by the fraud or failure of third persons, he will, unless his conduct be warranted by his instructions, or the usage of trade, be bound to make it good; if a stranger, for instance, calls upon him by a written authority to transfer the money in his hands, and the authority is a forgery, he will remain accountable for all that is transferred under it.

The principal is in general entitled not only to the bare amount of what has been received by his agent, but to all the increase which has accrued to the property while in his possession. The agent is, therefore, accountable for the interest, if any has actually been made, upon the balance in his hands; and likewise for every sort of profit or advantage which he may have clandestinely derived by dealing or speculating with the effects of his principal.

4. It is also the duty of an agent to apprize his principal, with all convenient expedition, of all material acts done or contracts concluded by him.

5. An agent, confidentially intrusted and relied on for counsel and direction—as an attorney, for instance—is rarely allowed, in equity, to take a gift from his employer; especially if it is a grant of the property which he has been employed to manage; and it is also a general principle, that an agent cannot make himself an adverse party to his principal —if he is employed to sell, he cannot make himself the purchaser: such a transaction is liable to be set aside in a court of equity, unless it be made clearly to appear that the principal gave his express consent to it, and that the agent furnished him with all the knowledge he himself possessed: and in like manner, an agent employed to purchase cannot be himself the seller; if he acts as such, he is accountable to his principal for all the profits he has made by his indirect dealing.

We are now to consider what are the obligations of the principal with respect to his agent; in other words, what are the rights of an agent.

1. The first right of an agent is to his commission; that is, the remuneration to be paid to him in return for his services. The amount of commission is sometimes determined by positive agreement between the parties; sometimes it is regulated by the usage of trade; and in some few cases, as of brokerage for the procuring of loans, &c., the amount of commission is limited by act of parliament.

An agent has no right to commission for doing any act not within his authority, unless it is afterwards adopted by his principal. He may also forfeit his right to commission by misconduct: as, if he keeps no account; if he makes himself an adverse party to his principal; or if, in consequence of his negligence or unskilfulness, no benefit accrues to the principal from the services performed.

2. Besides his commission, an agent is entitled to be reimbursed all such advances made on behalf of his principal, as are justified by his authority, whether express or implied, or subsequently sanctioned by his principal. And cases may sometimes occur of urgent danger, without means of ref

ring for instructions, in which an agent, acting for the best, is justified in making advances without particular directions, and under exigencies not provided for by regular rules of business. Thus if, on account of the lateness of the season, or other good cause, he insures the cargo without orders, he is entitled to charge his principal with the premium, and in such a case even the assent of the principal would be inferred from very slight circumstances. But an agent is not entitled to be reimbursed payments that are merely voluntary and officious; nor expenses occasioned by his own negligence or unskilfulness.

An agent has also, as a further security, a LIEN upon the property of his principal; that is, a right to retain it in his possession in the nature of a pledge for the satisfaction of his demands. Lien is either particular or general. A particular lien is a right to retain the thing itself in respect of which the claim arises. This right is very extensively admitted in our law, and is possessed by bailees in general, and consequently by all agents in the nature of bailees. [See LIEN.]

General lien is a right to retain any property of the principal which may come into the agent's possession in the regular course of business. This, being an extension of the general right, exists only where it is created by express contract, the previous dealings of the parties, or the usage of trade. Factors, packers, where they are in the nature of factors, insurance-brokers, and bankers, have, by usage, a general lien in their respective employments.

This right may in general be exercised in respect of any claim to commission or reimbursement, which the agent may have acquired in the due execution of his authority; but it does not extend to demands arising from transactions not within his course of dealing as such agent. An agent can, therefore, have no lien for debts due to him as agent for a third person, nor, as it should seem, for any demands which originated before the commencement of his agency.

An agent's lien does not attach unless the property is actually in his possession: a consignee has, therefore, no lien on goods consigned to him, if the consignor stops them before they come into his hands: nor unless it has come into his possession in the ordinary course of business; he has consequently no lien on property which has been casually left in his office, which has been deposited with him as a pledge for a specific sum, or which he has obtained possession of by fraud or misrepresentation. And if an agent parts with the possession of the property, the lien, being a personal right, is in general lost: but by stat. 6 Geo. IV. c. 83. (the factor's act,) if a factor pledges the goods or commercial documents of his principal as a security for advances made, with notice that they are not his own; or if, without such notice, he pledges them for a pre-existing debt due from himself, the lien of the factor on such goods or documents is transferred to the person with whom they are pledged; that is to say, in other words, he acquires the same right upon them which the factor, while they remained in his possession, could have enforced against the principal.

The right of lien may also be destroyed by the special agreement of the parties; and if the agent enters into a contract with his employer inconsistent with the exercise of the right, (as if he stipulates for a particular mode of payment,) he must be understood to waive it.

We have hitherto considered only the case of hired or paid agents; between whom and gratuitous agents there exists nearly the same difference with respect to their relative rights and duties as between bailees for hire and gratuitous bailees. [See Sir W. Jones, *On the Law of Bailments*.]

The responsibility of a gratuitous agent (the mandatary of the Roman law) is much less than that of one who is paid for his services. He will in general incur no liability, provided he acts with good faith, and exercises the same care in the business of his employer as he would in his own. But if he is guilty of gross negligence, or if, having competent skill, he fails to exert it, he will be answerable to his employer for the consequences. He has of course no right to commission, but he is entitled to be reimbursed for any reasonable payments made, or charges incurred in behalf of his employer. [For the principles of the civil law as to the rights and obligations of principal and agent, see Domat's *Civil Law*, book 1, tit. xv.]

II. Having considered what are the legal consequences of the relation of principal and agent, as far as regards the parties themselves, it now remains to explain the consequences of this relation as between the parties and third persons; and, first, as between the principal and third persons; and, secondly, as between the agents and third persons.

First, then, as between the principal and third persons: it is a general rule that the act of the agent is to be considered as the act of the principal; giving him the same rights, imposing on him the same obligations, and subjecting him to the same liabilities as if he had done it in his own proper person.

A bargain or agreement entered into by an agent is therefore binding upon his principal, whether it tends to his benefit or his disadvantage; and, in order to have this effect, it is not absolutely necessary that it should actually be within the agent's real authority, either express or implied, provided it be within what may most properly be called his *apparent authority*,—that is, provided it is such as the person dealing with the agent might, from the conduct of the principal, reasonably presume to be within his authority.

An authority may be presumed, first, from the principal's having previously authorized or sanctioned dealings of the same nature. Thus, if a person has been in the habit of employing another to do any act,—as, for instance, to draw or indorse bills,—he will be answerable for any subsequent acts of the same nature,—at least, until it is known, or may reasonably be presumed, that the authority which he had given has ceased. An authority may likewise be presumed from the conduct of the principal, with reference to the subject-matter of the transaction in question. For if a person authorizes another to assume the apparent right of engaging in any transactions, the apparent authority must, as far as regards the rights of third persons, be considered as the real authority. Thus, a broker employed to purchase has no authority to sell; and if he does, his employer may (unless the sale was in market overt) reclaim the goods so sold, into whatever hands they may have come. But if the principal has permitted the broker to assume the apparent right of selling the goods, he will be bound by a sale so apparently authorized.

Upon the same principle, where a general agent is employed,—that is, an agent authorized to transact all his employer's business of a particular kind, as to buy and sell certain wares, or to negotiate certain contracts,—he must be presumed to have all the authority usually exercised by agents of the same kind in the ordinary course of their employment: and though the principal may have limited his real authority by express instructions, yet he will not thereby be discharged from obligation incurred in the ordinary course of trade, towards persons who have dealt with the agent without any knowledge of such limitation. Thus where an agent purchases goods on credit, the seller may come on the principal for payment: and this right cannot be affected by any private agreement between the principal and agent, by which the agent may have stipulated to be liable to the seller.

Although the agent is, in all these cases, ultimately answerable to his employer for any damage that may follow from his having entered into an engagement not within his authority; yet the principal is, in the first instance, bound to keep an engagement so entered into by his agent upon a reasonable presumption of authority.

But in the case of a special agent (that is, of a person appointed merely to do certain particular acts), as no presumption of authority can arise from usage of trade, so the principal will not be bound by any act, not within the real authority of the agent,—and it lies upon those who deal with the agent to ascertain what that authority actually is.

Thus, in order to illustrate more fully the difference in this respect between general and special agents,—If a person employs a stable-keeper, whose general business it is to sell horses, to sell a particular horse for him; and he warrants the horse to be sound, inasmuch as the giving such warranty is within the ordinary course of his employment, the owner will be bound by such warranty, even though he may have directed expressly that none should be given; but if he employs another person to sell his horse, whose ordinary business it is not to sell horses,—then, although, if he has given no orders to the contrary, the agent will be justified in giving a warranty, as being a thing incidental to the main object of his employment; yet if he has given express orders that no warranty should be given, and the agent gives a warranty in opposition to his orders, he will not be bound by it.

As the agreement made by an agent, so likewise all his dealings in connexion with it, provided they are within his real or apparent authority, are as binding on the principal, as if they were his own acts.

Thus the representations made by an agent, at the time of entering into an agreement, (if they constitute a part of such agreement, or are in any way the foundation of, or inducement to it,) and, in many cases, even the admissions of an agent as to anything directly within the course of his employment, will have the same effect, as if such representations or admissions had been made by the principal himself. [See EVIDENCE.]

So also if notice of any fact is given, or if goods are delivered to an agent, it will be considered as notice or delivery to the principal. And in general, payment to an agent has the same effect as if it had been made to the principal, and in such cases the receipt of the agent is the receipt of the principal. But such payment is not valid if it is not warranted at law by the apparent authority of his agent.

Thus, if money is due on a written security, as long as the security remains in the hands of an agent, it is to be presumed that he is authorized to receive the money, and payment to him will therefore discharge the debt: but if the agent has not the security in his possession, the debtor pays him at his own risk, and will be liable, in case the agent should not account for it to his principal, to pay it over again.

So also if the principal gives notice to the buyer not to pay the money to the factor with whom he made the bargain, he will in general not be justified in doing so; but if the factor had a lien upon the goods for his general balance, then, inasmuch as his lien will attach upon the price of the goods when they are sold, he has a right to require the buyer to pay him instead of his principal: and such payment to the factor, notwithstanding any notice given by the principal, will operate as a discharge of the debt.

A principal is in general civilly liable for all damage occasioned to third persons by the negligence or unskilfulness of his agent within the scope of his employment; and for any misconduct or fraud committed by him, if it be either at his express command or within the limits of his implied authority.

From this liability, however, it is reasonable that those persons should be exempted, who, though they appear in some degree in the character of principals, yet have no power in the appointment of those who act under them. Thus the post masters-general, and persons at the head of other public offices, have been held not to be liable for the conduct of their inferior officers.

And, on the same principle, the owners and masters of vessels are by statute released from all liability to third persons from the negligence or unskilfulness of the pilots by whom they are navigated into port.

It now remains for us to state what are the effects of the relation of principal and agent, as between the agent and third persons.

An agent is not in general personally responsible on any contract entered into by him on behalf of his principal: to this rule, however, there are several exceptions.

First. If an agent has so far exceeded his authority that his principal is not bound by his act; as for instance, if an agent without any authority undertakes for his principal to pay a certain sum, or if a special agent warrants goods, contrary to his instructions; and the principal refuses to adopt such undertaking or warranty, the agent alone is liable to the person to whom it was given.

Secondly, an agent is liable where the contract was made with him individually. And, therefore, if in any contract made on behalf of his principal, the agent binds himself by his own express undertaking; or if the circumstances of the transaction are such that the credit was originally given to him and not to the principal, (whether such principal were known at the time or not,) in either of these cases he will be liable, in the first instance, to the persons with whom he has so dealt.

And for the same reason, when an agent takes upon himself to act in his own name, and gives no notice of his being employed in behalf of another person—as if a factor delivers goods as his own and conceals his principal—he is to be taken, to all intents, as the principal, and the persons who have dealt with him are entitled to all the same rights against him as if he actually were so. They may, for instance, in an action by the principal on demand arising from such transactions, set off a debt due from the agent himself; which they could not have done, if they had known that he acted only as an agent. And if he afterwards discloses his principal, he is, nevertheless, not discharged from his liability,—those with whom he has dealt may, at their option, come either upon him on his personal contract, or on the principal upon the contract of his agent.

And even where it is known, that the agent acts in a representative character, yet if the principal is not known, or if there is no responsible principal to resort to,—as may be the case with the committee of a club, or the commissioners appointed under a navigation act,—the agent will be personally liable on all the contracts he enters into.

An agent is likewise responsible to third persons for any wrongful acts, whether done by the authority of his principal or not;—and in most instances the person injured may seek compensation either from the principal or the agent, at his option.

An agent cannot delegate to another the authority which he has received, so as to create between his employer and that other person the relation of principal and agent: but he may employ other persons under him to perform his engagements, and the original agent is responsible to his principal as well for the conduct of such sub-agents, as for his own: but with respect to damage sustained by third persons from the wrongful acts of such sub-agents, the case is different; such damages must be recovered either from the person who in fact did the injury, or from the principal for whom the act was done. The original agent is responsible to third persons only for his own acts, and such as are done at his command.

The misconduct of an agent, besides the civil responsibility which it imposes on him, amounts in some cases to a misdemeanor, subject to very severe punishment. For if an agent intrusted with any money or valuable security, with written directions to apply the same in any particular manner, in violation of good faith converts it to his own use; —or if an agent intrusted with any chattel, valuable security, or power of attorney for the transfer of stock, either for safe custody, or for any special purpose, in violation of good faith, and without authority, sells or pledges, or in any manner converts the same to his own use, he is in either case guilty of a misdemeanor punishable with fourteen years' transportation. [See EMBEZZLEMENT.] But this does not extend to prevent his disposing of so much of any securities or effects on which he has a lien or demand, as may be requisite for the satisfaction thereof. It is also a misdemeanor, punishable in the same manner, if a factor or agent employed to sell, and intrusted with the goods or the documents relating to them, pledges either the one or the other, as a security for any money borrowed or intended to be borrowed, provided such sum of money is greater than the amount which was at the time due to the agent from the principal, together with any acceptances of the agent on behalf of his principal. Stat. 7 and 8 Geo. IV., cap. 29, sect. 49, &c.

AGESILA'US, younger son of Archidamus, king of Lacedæmon, succeeded his brother Agis, B.C. 398, to the exclusion of his nephew Leotychides, who laboured under the stigma of bastardy, being believed to be the son of Alcibiades, and not of Agis, his reputed father. As the crown descended in direct line from father to son, the succession of Agesilaus seemed, in his youth, to be barred; and his education was conducted as that of a private person, in all the strictness of Spartan discipline. He was lame, and advantage was taken of this to excite a prejudice against him: yet so high was his personal character, or so general the belief in the spurious birth of Leotychides, that by a vote of the general assembly, the heir-apparent was passed over, and Agesilaus was appointed king.

In the first year of his reign, a plot was formed to effect a change of government. The political constitution, established by Lycurgus, had degenerated into an oligarchy of a peculiar kind. Almost all political power, with the exclusive right to hold high civil or military office, was engrossed by those families who boasted to be of pure Spartan blood, the term *Spartan* being opposed to *Lacedæmonian*. This Spartan caste is supposed to have consisted of the legitimate and unmixed descendants of the original Dorian conquerors: the Lacedæmonians are conjectured to have been the progeny of enfranchised Helots, strangers associated into the citizenship, a remnant of the Achæi, and in a word, all who could not trace an unblemished line of Spartan descent to the early ages of the monarchy. Foreigners might become members of the community and Lacedæmonians: but they could never become Spartans; at least, Herodotus only knew of two instances up to his time (ix. 33, 35). The consequence was, that the bulk of the population became constantly more Lacedæmonian; in the time of Agesilaus, the number of Spartans had so dwindled, that they could not be spared for foreign service in any rank below that of commanders. The ephori, and all the leading officers of administration, civil and military, were taken from this privileged caste. The object of Cinadon's conspiracy, who complained that he counted only forty Spartans in the *agora*, or place of assembly, and that these were all official persons, was to extend the right of holding these high offices to all citizens. As happens in a majority of cases, the plot was discovered before it was ripe; Cinadon, the author and ring-leader, was executed, and the Spartans held fast their monopoly.

In order to prosecute more effectually the war with Persia (B.C. 396), Agesilaus was sent to command in Asia. At setting out, he pledged himself either to conclude an honourable peace, or to press his enemies so as to disable them from giving any further disturbance to the Greeks. His first object was to conciliate the Asiatic cities by prudent management and liberality; and he succeeded in reconciling their factions. It may be doubted whether the design of Agesilaus was limited to the protection of the Greek states of Asia. The recent example of the successful retreat of the *ten thousand* (see ANABASIS), the powers with which Agesilaus was invested, and the disorganized state of the Persian monarchy, would perhaps have tempted him to penetrate as far as Susa and Ecbatana, had he been allowed to follow up his successes. But the war that broke out in Greece, after he had been about two years in Asia, saved the Persian monarchy for a time, and reserved the triumph of its overthrow to the Macedonians and Alexander.

The intrigues of the Persians and the hatred of the Spartan influence had occasioned a dangerous league to be formed against Sparta; nor were the Spartans sorry to have an opportunity for going to war, especially against the Thebans, whom they detested for various causes (Xenophon *Hellenic.* iii. 5). Thebes, Argos, and Corinth declared against the Lacedæmonians, and Athens followed the example at the pressing instance of the Thebans. The ephori ordered Agesilaus home: in the height of his glory, and with the prospect of victory, he instantly obeyed. The Lacedæmonians and their enemies met near Coroneia in Bœotia, and a fierce battle took place (August, B. C. 394). The Thebans alone made a gallant resistance; and the Spartan king was wounded, who obtained only a doubtful victory. He returned to Sparta, not importing with him the luxuries of Asia, but adhering to the temperance and frugality characteristic of his country's discipline. Those virtues were peculiarly Spartan: and that nation was not exempt from the meanness of jealousy. The probability of Athens recovering her former power after her walls were rebuilt (B.C. 392), induced the Spartans to send Antalcidas (B.C. 387) with proposals to Persia, favourable to themselves, but disadvantageous to the rest of Greece. The bearer of these offers was the personal enemy of Agesilaus, and was supposed to have a mean pleasure in lessening his power and tarnishing his glory. The Persians dictated the treaty in the language of conquerors (Xen. *Hellen.* V., i. 31). All the Grecian cities of Asia were to be subject to the king of Persia: all the rest to be independent: the king was to keep possession of Cyprus and Clazomenæ; and the islands Lemnos, Imbros, and Scyros, were given to the Athenians, to whom they formerly belonged. Artaxerxes concluded with denouncing war against those who should not submit to his terms. The Thebans refused; but their steadiness was shaken by preparations for coercion on the part of the ephori, invidiously recommended by Agesilaus, in revenge for a former affront. Thus the bad policy of the Greeks, arising from their foolish dissensions, annihilated the advantages which should have been the fruit of victories and military virtue of no common stamp. Sparta had now, though not worthily, recovered her power in Greece. Her virtues, indeed, were to be found rather in adversity than prosperity; nor did she profit by her own experience, that tyranny leads to the destruction of the tyrant. Phæbidas, one of her generals, on his march into Thrace against Olynthus, was encamped in the neighbourhood of Thebes, while parties were so nearly balanced, that Ismenias and Leontiades, the heads of opposite factions, exercised the chief magistracy together. Leontiades, who *courted* the friendship of Lacedæmon, secretly introduced Phæbidas and his troops into the Cadmeia, the citadel of Thebes (B. C. 382). This at once gave the superiority to that party of which he was the head: Ismenias was apprehended, and 400 of his friends immediately fled to Athens. Complaint was made at Sparta of this treacherous aggression in time of peace. Agesilaus was, in general, more just and liberal than the rest of his countrymen; but he contended that it was necessary to examine whether the possession of the Cadmeia was of advantage to Sparta, to which every other consideration must give way: and in this instance, he not only discredited, but contradicted his better thoughts. On a former occasion, speaking of the king of Persia, he said, 'Can this king, whom you call Great, be more so than I, if he be not more just?': this anecdote rests on Plutarch's authority. The decree of the Spartans was, as we might expect, in their own favour. The assembly resolved to keep the citadel, and to bring Ismenias to trial, who had been seized and imprisoned by his opponent, ostensibly on the vague charge of seeking Persian connexions, but really for the vote which he had carried, forbidding any Theban to join the army of Phœbidas. But a counter-revolution was soon effected; and the Spartans were compelled to evacuate the citadel.

That the Lacedæmonians, when now at the height of power, were all at once involved in a train of misfortunes which effectually broke that power, is ascribed by Xenophon to the divine anger against their perfidious seizure of Thebes. Agesilaus probably had come round to the same opinion; for he excused himself from the command of the army sent to reduce the Theban revolutionists, on the plea of being weighed down by age. His colleague, Cleombrotus, was appointed in his stead. The events which occurred during the absence of Agesilaus, form no part of the present subject. On returning home, Cleombrotus left Sphodrias at Thespiæ, in command of part of his army. Sphodrias, whether from his own folly, or, as many believed, induced by Pelopidas, made a most unwarrantable and faithless inroad upon Attica. The Athenians complained to Sparta, and Sphodrias was recalled, and brought to trial. Unfortunately, Agesilaus was persuaded to exert his influence in the delinquent's favour and he was acquitted; at which the Athenians were so much offended, that they immediately concluded an alliance with Thebes against Sparta. Agesilaus then resumed the command, and held it through two successive campaigns, till obliged to resign through failing health.

The battle of Leuctra, (B.C. 371,) in which the Lacedæmonians under Cleombrotus were overcome by inferior numbers, produced a striking instance of Spartan character. The news arrived at Sparta during a religious festival, but the ephori did not allow the celebration of it to be interrupted. The list of the slain was sent to the houses of their kindred, and the women were told to bear their sorrows in silence. Those parents whose children had met with a glorious death went abroad the next day to receive congratulations; the friends of the survivors kept their houses, as if in shame and sorrow. On this occasion, a number of the combatants having fled, Agesilaus was allowed to suspend the law, which visited cowardice with disgraceful punishment. He prudently announced that it might sleep for one day only, and then resume its power.

There was a proverb, frequently repeated by Agesilaus, 'That a Spartan woman had never seen the smoke of an enemy's camp:' but he had the mortification to see his proverb belied. The Theban army increased daily by the defection of the allies of Sparta: it penetrated into Laconia, and laid waste the whole country; the city, however, was saved by the prudence of Agesilaus, who shut himself up in Sparta, and avoided an engagement. Epaminondas did not venture to assault the city; and at last, his allies growing weary of the service, the winter approaching, and relief coming to Sparta from Athens, the Theban general found it necessary to retreat.

After the death of Epaminondas, at the battle of Mantinæa, (B.C. 362,) the weariness of all parties produced a partial cessation of hostilities. Agesilaus was now above eighty years old, but he had still vigour enough left to lead an army into Egypt, to assist the Egyptians who had rebelled against the Persian king. According to Plutarch, Agesilaus went expressly to help Tachos against his master King Artaxerxes II.; but a rival to Tachos starting up in the person of Nectanebos, another Egyptian, Agesilaus found it convenient to change sides. That his motives were not of the purest kind, may very safely be asserted. After establishing Nectanebos in the government of Egypt, the old king set out on his voyage homewards, loaded with money and presents, the reward of his services and his treachery. Being driven by contrary winds on the coast of Africa, he died there at the advanced age of eighty-four. His attendants preserved the body in melted wax, and took it to Sparta to be buried, consistently with the usages of their country, which did not allow the body of a king to rest in a foreign land.

The character of Agesilaus is exalted by Xenophon far above its merits. The historian was on terms of personal intimacy with the Spartan king, and was besides no great admirer of the constitutional forms of Athens, his native city, which he loved to contrast disadvantageously with those of Sparta. We may admire the energy and vigour of Agesilaus, and grant him a full share of those peculiar virtues, as they are termed, which characterized his country. He may also have been temperate in his habits, kind to his friends, and not cruel to his enemies; but more than one public act of his life is of such a description as to throw suspicion on his integrity as an individual and a statesman. (See Plutarch's *Life of Agesilaus;* Xenophon's *Hellenica,* and *Panegyric on Agesilaus;* Pausanias, iii. 9.)

AGGERHUUS, a name of one of the five great divisions of the kingdom of Norway, better known under that of CHRISTIANIA.

AGGERZEEN, the name of a species of large antelope, mentioned by Pearce, in his *Account of his Residence in Abyssinia.* Unfortunately he gives no account of its form, nor description of its characters, and the only information which he affords of its habits is, that it occasionally mixes with the herds of domestic cattle which graze in the vicinity of the forests, and that the natives esteem its flesh for making brind, that is, meat cut into long slices of the breadth and thickness of a man's hand, and dried in the sun. This meagre account is insufficient to enable us to identify the species; but if, as we suppose, the aggerzeen of Pearce be the same animal which Salt mentions in the *Appendix to his Second Journey,* under the name of agayen, it would appear, according to the report of that traveller, to be the koedoe of the Cape, the antelope *Strepsiceros* of naturalists; a species which inhabits moist, woody situations, and to which the physical characters of the low parts of Abyssinia are in all respects well adapted. We have not been able to find the name in Lobo, Poncet, Bruce, or any other traveller. (See ANTELOPE, *Strepsiceros.*)

AGHRIM, a village in the county of Galway, in Ireland, famous for the great victory obtained in its neighbourhood, on the 12th of July, 1691, by the forces of King William, commanded by General Ginkell, over those of King James, commanded by General St. Ruth. The latter were 25,000 strong, and very advantageously posted; the former amounted only to 18,000, and had to march to the attack through a bog, in which they sunk up to the middle. The result was in a great measure owing to the circumstance of General St. Ruth being killed by a cannon ball in the early part of the action; and the officer who took the command having, through a jealousy which subsisted between them, been left in ignorance of the dispositions of his superiors. The attack of the English, however, was singularly bold in conception, and the impetuosity with which it was commenced was sustained in a manner which has probably never been surpassed. The victors, not satisfied with gaining the battle, followed up their success with a terrible slaughter of the defeated and flying enemy, whom they pursued till night-fall: no fewer than 7000 are said to have been destroyed. Only 450 prisoners were taken. The loss of the English did not exceed 700 killed, and 1000 wounded. All the enemy's baggage and ammunition fell into their hands; and the victory was followed by the immediate and complete submission of Ireland. The accounts of this battle mention an old castle of Aghrim, which was occupied by a party of the Irish infantry. In Archdall's *Monasticon Hibernicum* it is stated, that there was formerly here a priory of canons regular of St. Augustine, which was said to have been founded in the 13th century. Aghrim, which is a vicarage, in the diocess of Clonfert, had, in 1806, a church in good repair, with a glebe house, and above twenty acres of glebe. [See Carlisle's *Topographical Dictionary of Ireland,* 1814.] It is in the barony of Clonmacow, and is situated twenty-eight miles east from the town of Galway, and seventy-five miles west from Dublin. The village is now much decayed. There is another Aghrim in Wicklow, (sometimes mistaken for that at which the battle took place,) which is a market-town, situated on the banks of the Ovoca, or Avoca, thirty-five miles from Dublin. There is also a village named Aughrim in the county of Roscommon.

AGINCOURT, or AZINCOUR, a village in the department of Pas de Calais, France, in the ancient province of Artois, celebrated for a great victory obtained by the English under Henry V., over a French army vastly superior in numbers. Encouraged by the distracted condition of France, where the imbecility of Charles VI. had allowed the quarrels of the nobility to reach a great height, prompted by his own ambition, and perhaps desirous of finding employment for the turbulent spirits of his own court, the English monarch, in 1415, conveyed over to Normandy (the hereditary possession at one time of his ancestors) a considerable army, and having reduced the town of Harfleur near Havre, set out for Calais. The siege of Harfleur occupied thirty-six days; and the loss sustained by the English, principally by sickness, during this period, was immense. Upon reaching Abbeville and Amiens, Henry found the passes of the Somme guarded, and the bridges broken down; but, having erected a temporary bridge, at a place called Nesle, he passed his army over, and, pursuing his route, came to an engagement with his opponents on the 25th of October in the year abovementioned. The disparity of forces was very great: the English army, at the commencement of the invasion, consisted of about 2500 men at arms, 4000 archers on foot and as many on horseback, and other troops to the number of 1000; but the attendants of the men at arms and other followers swelled the whole to about 30,000. The loss during the siege, the garrison left to defend the conquest, the ravages of disease (the dysentery), and the desertion of several, reduced this force exceedingly. An ancient muster-roll, still extant, gives 812 as the number of men at arms who were with the king at Agincourt, and 3071 archers; so that, allowing two attendants to each man at arms, we have a total of rather more than 5500. No ancient English writers make the number more than 10,000; and two French writers, one of whom was with the English army, say it was about 11,000 or 12,000. Other French writers make it 15,000, 18,000, or even 20,000. The accounts of the number on the other side differ as widely, varying from 50,000 to 150,000.

The previous night was passed by the English near the village of Maisoncelles, in preparing their weapons, confessing themselves, and receiving the sacrament; by the French, who were posted a mile off, between Ruissauville and Agincourt, in gaming and drinking. The descriptions of Shakspeare, in which these circumstances are mentioned, are supported by the contemporary chroniclers. In the morning the armies were formed. The English archers were posted in front, supported by the main body under the king in person, and flanked by the wings under the Duke of York and Lord Camoys respectively. The baggage had been left under a guard near Maisoncelles, and with it several priests on horseback, who put up their prayers for the success of their countrymen. The archers, to whom the victory was mainly owing, wore little armour, but, in addition to their bows, they had hatchets or swords hanging from their girdle; many were barefooted and had no hats, while others had leather caps crossed with iron. Henry had, during the march, ordered them to provide themselves with long stakes, which they might plant before them to resist the charge of cavalry.

The French were drawn up in three lines; the first under D'Albret, Constable of France (who commanded in chief), accompanied by many noblemen; the second under the Duke of Alençon, the Duke of Bar, and others; and the third under Counts Marle, Dampmartin, &c. The ground, being between two woods, was too narrow for them to avail themselves usefully of their superior numbers; and a heavy rain which had fallen the night before, and the trampling of the horses, who were kept moving all night by the pages, had broken it up.

Henry, who had heard mass in the morning, addressed his little army; and after an unavailing negotiation (commenced by the French), Sir Thomas Erpingham, who had drawn up the archers, threw up his truncheon, and gave the signal for the attack. The volleys of arrows did fearful execution among the French, while the stakes of the archers enabled them to repel the attack of some cavalry on their flanks. They gave way, indeed, for a minute, to the charge of the French line under the Constable, but, rallying, they cast aside their bows, and made havoc with bill-hooks and hatchets. The French pressed on over the dead until they were piled up almost to the height of a man, and then the English mounted on the heaps, and slaughtered their enemies, whose heavy armour and crowded array rendered them almost incapable of resistance. The first and second lines of the French were routed, notwithstanding a brave attempt of the Duke of Alençon to rally his forces. That nobleman exchanged blows with the king himself, and was slain, as were a vast number of knights and noblemen. The third line fled, with the exception of their leaders and a few others, who were either killed or taken; and, after a contest of three hours, the victory remained with the English. During the battle the baggage of the victors was plundered by some peasants and a few men at arms; and upon a report of this, and of the rallying of the French rear, Henry ordered the prisoners taken to be slain. This cruel order was, except with respect to a few men of rank, complied with.

The loss of the respective armies is variously stated: that of the French was probably 10,000, including the Constable, three Dukes, five Counts, and ninety Barons. The victors lost probably 1200, including the Duke of York, the Earl of Suffolk, and one or two other persons of rank. Henry continued his march to Calais, which he reached on the 29th, and from thence proceeded to Dover and London, which last he entered, with great pomp, on the 23rd of November. The immediate consequences of the battle were by no means important. It was a useless display of valour, prompted by personal ambition. Upon such fearful scenes of carnage mankind will, one day, look with astonishment and shame, instead of admiration. [See Nicolas's *History of the Battle of Agincourt*, 1827.]

AGIO, a term generally used to denote the per centage difference existing between the values of the current and standard monies of any place. The metallic currency of wealthy states generally consists of its own coin exclusively, and it is in the power of the state to prevent the degradation of that coin below the standard, so that no calculations of agio, strictly so called, are rendered necessary. In smaller states, the currency seldom entirely consists of their own coin, but is made up of the clipt, worn, [and diminished coins of the neighbouring countries with which the inhabitants have dealings. Under these circumstances, banks were, at different times, established by the governments of Venice, Hamburg, Genoa, Amsterdam, &c., which, under the guarantee of the state, should be at all times bound to receive deposits and to make payments, according to some standard value. The money, or obligations of these banks being better than the fluctuating and deteriorated currency of the country, bears a premium equivalent to the deterioration, and this premium is called the agio of the bank.

To facilitate his money dealings, every merchant trading in a place where the deterioration of the currency is thus remedied, must have an account with the bank for the purpose of paying the drafts of his foreign correspondents, which drafts are always stipulated to be paid in bank or standard money. The practice being thus universal, the commercial money payments of the place are usually managed without the employment of coin, by a simple transfer in the books of the bank from the account of one merchant to that of another. The practical convenience, which this plan of making their payments affords to merchants, who would otherwise be obliged, when discharging obligations incurred in standard money, to undergo troublesome and expensive examinations of the various coins in use, causes the money of the bank to bear a small premium above its intrinsic superiority over the money in circulation, so that the agio of the bank does not usually form an exact measure of that superiority.

The term agio is also used to signify the rate of premium which is given, when a person having a claim which he can legally demand in only one metal, elects to be paid in another. Thus in France, silver is the only legal standard, and payments can be demanded only in silver coin, a circumstance which is found to be so practically inconvenient, that the receiver will frequently pay a small premium in order to obtain gold coin, which is more easily transportable; this premium is called the agio on gold.

AGIS. Four kings of Sparta have borne this name. The first was the son of Eurysthenes, and grandson of Aristodemus, to whom Laconica was allotted after the Heracleid invasion. Aristodemus had two sons, Eurysthenes and *Procles*; and this Agis was, therefore, the second in one of the series of that double race of kings, which reigned conjointly. No certain dates can be assigned to these early times. The other kings bearing this name were of the race of the Proclidæ. (See Pausanias, iii. 2.)

AGIS II. the son of Archidamus, reigned from B.C. 427 or 426 to 397, and was actively engaged in the Peloponnesian war. In the fourteenth year of the Peloponnesian war, the Lacedæmonians endeavoured to recover their influence in Peloponnesus, and marched out with all their force under Agis. His generalship was so skilful, that the Argeian army, against which his operations were directed, was completely hemmed in, and exposed to great danger. Two Argeians went privately to Agis, and pledged themselves to effect a reconciliation between their country and Lacedæmon, if he would grant a truce of four months. To this he consented on his own authority. The order to retreat was heard with astonishment by the army of Agis, and the Argeians, on their part, were highly incensed against their countrymen for having defrauded them of an opportunity, as they thought, of destroying the enemy. The Lacedæmonians were loud in their displeasure against Agis for his retreat. He was called to account, and it was proposed to fine him, and demolish his house; but his humble demeanour and earnest entreaty prevailed, and he was allowed to resume the command, under the mortifying restriction of a superintending council. But he made amends, a short time after, by defeating the Argeians, and their allies the Athenians, in a great battle. [Thucydides, v.—Pausanias, iii. 8.]

In B.C. 421, the Eleians had been involved in a dispute with Sparta, which afterwards led to their taking a part in the war just alluded to, as allies of the Argeians. Agis conducted an army into Elis, which yielded him abundant spoil, since it had usually been accounted sacred ground, as the scene of the Olympic festival, and therefore exempted from the ravages of war. The resort of strangers to the games also brought a great accession of wealth. The city of Elis, as neutral ground, was unfortified; and Xenophon says, that Agis was supposed rather to be unwilling than unable to capture it. At the siege and surrender of Athens, accompanied with the mortifying demolition of the long walls, and the fortifications of Peiræeus, Pausanias and Agis, the two kings of Sparta, with the whole strength of the Peloponnesian allies, conducted the operations by land, while Lysander blockaded the city with his fleet. Agis was succeeded by his brother Agesilaus. [See AGESILAUS.]

AGIS III., the son of another Archidamus, reigned from B.C. 338 to 331 or 330. At the time of the battle of Issus, (B.C. 333,) Agis was communicating with the Persian naval commanders in the Ægean, to obtain supplies for the war against the Macedonians. While Alexander was engaged in his fourth campaign in Asia, (B.C. 331,) an action between Agis and Antipater, whom Alexander had left governor of Macedonia, took place in Peloponnesus. Authorities differ as to the precise date of the battle: Plutarch ascribes it to the year here mentioned; Diodorus places it one year later. The Lacedæmonians had formed the siege of Megalopolis, which however held out till the arrival of Antipater to its relief. A bloody battle was fought, in which the Lacedæmonians behaved with their accustomed gallantry, but were overpowered by superior numbers. Agis, their king, fell after this phalanx was broken, and with him more than five thousand three hundred of the Lacedæmonians and their allies. After this defeat they sued for peace, and obtained it: giving hostages that they would submit to Alexander's decision on their fate. (Pausan. iii. 10. Arrian, ii. 13.)

AGIS IV., son of Eudamidas II. (B.C. 244). On his accession to the throne, at the age of twenty, at a period when the public manners had degenerated from their ancient severity, Agis undertook the task of restoring the institutions of Lycurgus. His system carried with it its best recommendation, and the sure pledge of its sincerity, in his own personal example. But unfortunately, both for himself and his country, his colleague, Leonidas, had formed his habits in the luxurious court of Seleucus, king of Syria. The manners of the mass of the people, as well as of the rich, had become tainted, and so wide as well as general had been the departure from the original pattern of conduct, that it seemed hopeless to attempt a general correction of abuses. The privileged class, to whom the name of Spartans was confined, was now reduced to seven hundred heads of families, of whom not more than one hundred enjoyed wealth; such was the effect of the inequality introduced by intercourse with strangers, and especially the Persians, and by the gains attendant on success in war. The oligarchy was rich, haughty, and licentious; the poor were oppressed and burdened with debt. These considerations suggested the immediate adoption of measures, sanctioned by the venerable authority of Lycurgus; but the event proved the hopelessness of reform, when the evils of corrupt government had worked their way into the sentiments and habits of the people. The two great features of the proposed reformation were, the renewal of the partition of the lands, and the abolition of all debts; the latter measure, which must in all cases necessarily be one of injustice, throws suspicion on the character of Agis, who otherwise might pass for an honest reformer. But the rich and luxurious, as Plutarch has it, shuddered at the very name of Lycurgus, like runaway slaves about to be led back to their masters. Agis also proposed adopting as an act of the legislature, what Cinadon, in the reign of Agesilaus, (see Agesilaus,) had attempted to effect by conspiracy; namely, to abolish the distinction between Spartans and Lacedæmonians, retaining that between the Lacedæmonians and the Periœci, or people of the smaller towns. These latter, however, were to be trained in the strict discipline of Lycurgus, and to succeed to the privileges of citizenship as vacancies occurred. In laying his proposals before the senate, Agis recommended them most strongly by the offer of the first personal sacrifice, in the contribution of his own lands and money to the common stock. His mother and his kindred followed his example. The multitude applauded: but Leonidas and the rich men opposed the plan, and persuaded the senate to reject it: the question was lost only by a majority of a single vote. To rid himself of Leonidas, Agis contrived to get Lysander appointed one of the ephori; who forthwith accused Leonidas of having violated the laws, by marrying a stranger, and residing for a time in a foreign land; two acts forbidden to the race of Hercules. Leonidas could not venture to make his appearance; he was therefore deposed, and his crown devolved to his son-in-law, Cleombrotus, who co-operated with Agis in his measures of reform. On the expiration of Lysander's office, a reaction took place. As the reformers now despaired of succeeding by mild means, Agis and Cleombrotus went to the place of assembly, plucked the ephori, now of the anti-reforming party, from their seats, and placed others in their room. This violence was not followed up by personal injury. The life of Leonidas, who had returned into the city during the short triumph of his faction, was threatened; but Agis himself protected him from assassination, meditated against him by Agesilaus, who was the uncle of Agis. The want of sincerity in this unworthy relation of the reforming king occasioned the failure of the scheme, when all its difficulties seemed to have been nearly overcome. Agesilaus was deeply involved in debt: he therefore persuaded the two kings to burn all deeds, registers, and securities in the first instance. When the division was proposed, he devised repeated pretexts for delay. Before the first measure, owing to these underhand practices, could be completed, the Achæans, who were allies of Sparta, applied for assistance against the Ætolians, who threatened to lay waste the country of Peloponnesus. Agis was, therefore, unavoidably sent to command the army, and exhibited the same republican virtues in his military office, as in his civil administration. His popularity was deservedly great; and it enabled him, notwithstanding the licentious spirit of the times, to preserve the strictness of ancient discipline. He now joined his forces to those of Aratus, whose over-caution left no room for enhancing the glory of the Lacedæmonian soldiery: but the conduct of the troops, and the rigid performance of every duty on the part of their commander, impressed both the allies and the enemy with respect for the commonwealth.

On the return of Agis, he found that a change had taken place in the condition of his country. The poor had been disgusted by finding, that although Agesilaus was again one of the ephori, the lands were not divided according to promise. Their anger was natural enough, but they directed it unjustly and unwisely. They threw themselves into the party of their own enemies, and suffered them to dethrone Cleombrotus and restore Leonidas to power. The tide of popular favour had turned against Agis, and he was compelled to fly to sanctuary. Some treacherous friends entrapped him, got possession of his person, and dragged him to prison. Being questioned by the ephori, whether he did not repent of having introduced innovations into the state? he replied, that in the face of death, he would not repent of so worthy an enterprise. He was condemned, and executed with indecent haste; the plea for this was, the danger of a rescue. One of his executioners was moved to tears. Agis, observing this mark of feeling, said, 'Lament me not; though I suffer unjustly, I am happier than my murderers.' The cruelty of the victorious party did not end here: his mother and grandmother were strangled on his body. His reign lasted only four years. His widow was forcibly taken out of her house by Leonidas, and married against her will to his son Cleomenes. Though a husband by compulsion, Cleomenes was attached to his wife, whose conversation inspired him with the desire of accomplishing the projected reform. [See Cleomenes.] (Plutarch's *Life of Agis.*)

AGISTMENT. This word is taken from an old French word *gister*, 'to lie down.' The original application of the term will appear from the explanation of the legal meaning of agistment. When the owner of land depastures the cattle of another person at a certain rate per week or month upon his ground, he is said to *agist* such cattle: and this contract is so called because the stranger's cattle are permitted *agister*, that is, to lie down, or be domiciled in the land appropriated to them.

AGNA'NO, a remarkable lake near Naples, not far from the road leading to Pozzuoli and Bajæ. Its bed is supposed to have been formerly the crater of a volcano; it is about two miles round, and entirely surrounded by hills rising in the form of an amphitheatre. Some antiquaries have started the supposition, that this lake was originally the fish pond of Lucullus' villa, that wealthy Roman having had a magnificent residence in this neighbourhood. The banks of Agnano present a striking scene of solitude; hardly any habitation is to be seen on the slope of the hills; the country is very unwholesome in summer, and the malaria is increased by the practice of the country people steeping large quantities of flax in the water of the lake. The pestilent effluvia reach high up the hills, even to the convent at the summit of Mount Camaldoli, from which there is perhaps the finest view in all the neighbourhood of Naples. Tradition says, there was formerly a town on the site of Agnano, which was swallowed up in some earthquake, the epoch of which is unknown. Near the banks of the lake are the natural vapour-baths of San Germano, which are beneficial in cases of rheumatism and gout. On the opposite side is the famous *Grotta del Cane*, a small cave in the rock from the ground of which a mephitic vapour issues, which has the power of depriving a dog or other animal of all sensation in a few minutes. There is no mention in the ancient writers, either of Agnano or of the Grotta, only Pliny the Elder says in his Natural History, that in the country about Puteoli there were vents in the ground from which deadly vapours arose. Traces of ruins of mosaic pavements, and stoves for baths, are found scattered in the neighbourhood. On the western side of the lake rises the volcanic hill of Astroni, the extinct crater of which, nearly three miles in circumference, has been converted into a royal park and preserve, planted with large trees, and abounding in game of every description.

AGNESI (Maria Gaetana) was born at Milan in 1718. When very young, she distinguished herself by the acquisition of various languages; she is said to have understood Latin, Greek, Hebrew, French, German, and Spanish. She then turned her attention to mathematics and philosophy, and at the age of 19, wrote in defence of 191 theses which were published in 1738, under the title of *Propositiones Philosophicæ*. In 1748, she published her celebrated work, *Instituzioni Analitiche ad uso della Gioventù Italiana*, in two volumes, 4to. The first volume contains the elements of Algebra, with the application of Algebra to Geometry; the second contains an excellent treatise on the Differential and Integral Calculus. In 1750, her father, who was then a professor of the university of Bologna, being ill, she obtained permission from the Pope Benedict XIV. to supply his place. She ended her career, but in what year we cannot ascertain, by retiring into a convent, and taking the veil. She died in January, 1799, aged 81.

The second volume of the *Analytical Institutions* was translated into French by D'Antelmy, with additions by Bossut, and published at Paris in 1775. The whole was translated into English, and published at the expense of Baron Maseres in 1801.

There is an éloge of Agnesi by Frisi, translated into French by M. Boulard, which we have not been able to obtain.

AGNOLO, BACCIO d', a Florentine, was at first a wood-engraver, and afterwards an architect. He was born in 1460, and had already acquired considerable reputation in the practice of his earlier profession at Florence, when he was attracted to the study of architecture, and went to Rome to pursue it among the remains of antiquity there. He appears, nevertheless, during his residence in Rome, to have continued to employ himself in his art and business as a wood-engraver, probably for the means of subsistence, and his study or shop was frequented by the most eminent men of taste and learning then in Rome. Among these were Raffaelle, Michael Angelo, Sansovino, and the brothers Sangallo.

On settling himself as an architect in Florence, Baccio was engaged in several works of importance there, and acquired notoriety of a disagreeable nature through deviations from the ordinary practice of the time. He adorned the windows of a mansion or *palazzo*, (as the Italians term the large town-house of a distinguished person,) in the Piazza di Santa Trinità, with frontispieces, and put a frontispiece, consisting of columns with a regular entablature, to the portal, in the manner, indeed, which has been so commonly practised ever since, and is at the present time in vogue, but which had been restricted to churches up to this time. All the wits in Florence set upon poor Baccio, who was lampooned and ridiculed in every possible way, for making, as it was said, a palace into a church; indeed, he was almost induced to retrace his steps, but being conscious that he had done well, 'he took heart and stood firmly.' It was a novelty, and as the biographer of all the architects says, 'like almost all other novelties, it was at the first scorned and afterwards worshipped.' But the same writer is somewhat severe on him for making, perhaps, too bold a crowning cornice to the front of this identical edifice, saying, that it looked like a boy with a huge hat on his head!

Baccio had been engaged to complete the architectural arrangements about the tholobate or drum of the cupola of the metropolitan church of Santa Maria del Fiore, which were left incomplete by Brunelleschi, and whose design for that part was lost. Baccio was about to supply what was wanting after his own invention, and had begun to cut away the toothings left by Brunelleschi in the work because they did not suit what he proposed to do. At this juncture Michael Angelo happened to come to Florence from Rome, and attacked him so violently on the unfitness of his design, that Baccio was stopped, and in consequence of subsequent disputes on the subject, the edifice, in that particular, still remains incomplete.

Baccio d'Agnolo died in 1543, being eighty-three years of age, and left a son Giuliano, an engraver and architect, who succeeded to the direction of his father's works. The most esteemed of Baccio's productions are the villa Borghesini, near Florence, and the campanile or bell-tower of the church di Santo Spirito (a production of Brunelleschi's), in Florence. By some writers, the great palazzo Salviati, in the Transtiberine portion of Rome, is attributed to this architect, but it is more commonly referred to Nanni di Baccio Bigio, a man of far inferior merit and reputation to Baccio d'Agnolo.

A'GONUS, in Ichthyology, a genus of Acanthopterygious fishes, first separated from the Cotti by Block, and afterwards adopted, by Lacepede and Pallas, under the different names of Aspidophorus and Phalangistes. The greater number of the species belonging to the genus Agonus are found in the northern Pacific ocean, particularly along the coast of Japan, and northwards as far as Behring's Straits. They are all of diminutive size, never exceeding nine or ten inches in length, and are no where used as an article of human food. One species only, the Pogge, (*A. Europæus,*) inhabits our own coast, as well as the coasts of France, Holland, Iceland, and even Greenland; it is also found in the Baltic, but according to Baron Cuvier, never in the Mediterranean, though Brunnich expressly affirms the contrary.

[Agonus Accipenserinus.]

The reader who desires a detailed description of the characters of this genus is referred to Schneider's edition of Block's *Systema;* the *Spicilegia Zoologica* of Pallas; an excellent monograph of the genus by Tilesius, in the fourth volume of the *Memoirs of the Academy of Sciences of Petersburg*, and more particularly, the *Histoire Naturelle des Poissons*, of the late Baron Cuvier and M. Volenciennes.

AGOSTA, OR AUGUSTA, is a sea-port town on the south-east coast of Sicily in the *Val di Noto.* The town was built in the 13th century, by the Emperor Frederick the Second, on a low peninsula. On its north side the peninsula is connected with Sicily by a long narrow causeway, having considerable salt ponds on each side. The harbour formed by this projection is one of the safest and most sheltered in the island of Sicily. This town suffered from an earthquake in the year 1693, by which it was nearly reduced to ruins; during the shock, the powder magazine in the citadel exploded, and the light-house was thrown into the sea. Various accounts agree in stating, that one-third part of the inhabitants were crushed to death by the falling buildings. The town has since been rebuilt on a regular plan, and in order to mitigate the evils of any similar visitation in future, the houses are all made very low. The place is slightly fortified on the land side, and is protected towards the sea by three forts, built on as many small islands at the entrance of the port. Agosta has never recovered the degree of importance which it enjoyed previous to the earthquake. The knights of Malta, during the time of their prosperity, had a considerable establishment and extensive magazines at this port. The trade of Agosta is in wine, flax, olive-oil, salt, and sardines. The remarkable caves of Timpa are in its vicinity. The town is situated eighteen miles north of Syracuse in 37° 8′ N. lat., and 15° 8′ E. long. Population said to be about 15,000.

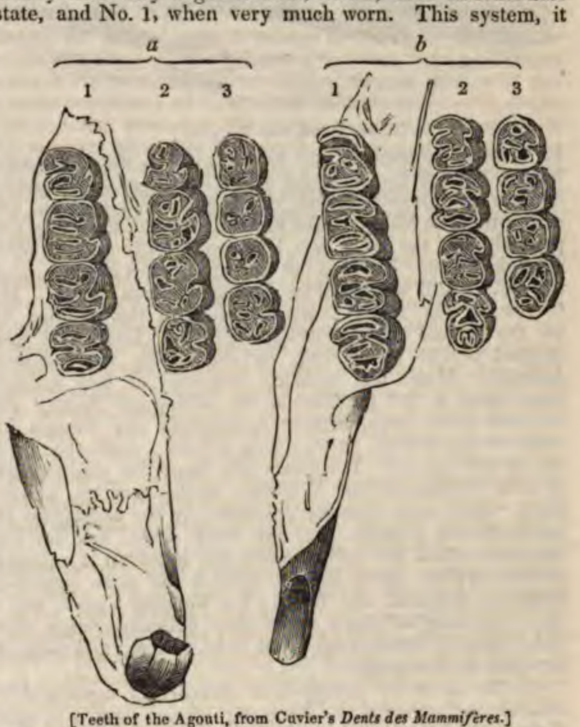
AGOUTI, (*Dasyprocta*, Illiger; *Chloromys*, F. Cuvier,) in Zoology, a genus of animals belonging to the class Mammalia and order Rodentia. The peculiar and appropriate character of the Rodentia consists in having two long incisors, or front teeth, in each jaw, with which they not only mince and triturate the hard substances which serve them for food, but which they likewise apply to a great variety of other purposes, such as the formation of subterraneous burrows, hollowing out artificial habitations in the trunks or among the roots of trees, sometimes even cutting down very large timber, as in the instance of the beaver, and generally in gnawing and destroying whatever they happen to encounter. To enable them to perform these operations, the incisor teeth, which, with these animals, are also the most important organs of mastication, are shaped something like a chisel. They are extremely sharp on the external edge, and slope abruptly towards the internal, so that the plane of the outer surface makes with the crown of the tooth a very acute angle. Neither is the enamel or hard flinty principle of the teeth dispersed through the body of these organs in waving irregular lines, as in the molar teeth of all animals which feed upon vegetable substances, but it is here accumulated in a particular part, covering the external surface of the tooth like a thin crust, so that the heart and inner edge, being composed of softer substances, (viz., common bone or ivory,) wears much more rapidly than the external surface, and thus continually preserves the sharp-edged, chisel-shape of the tooth, so essential to the economy of the animals. Leading as they do a peaceful, harmless life, and feeding principally upon vegetable substances, the rodentia are destitute of canine teeth; but in the number, form, and composition of their molar teeth, as well as in the number, separation, and moveableness of their toes, they present an almost infinite variety, and it is upon these differences that their generic characters are principally founded.

Though zoologists have not succeeded in subdividing the rodentia into natural families, distinguished by the same definite and logical characters as have been developed in some of the other orders of mammals, they admit of being distributed into small natural groups, the component parts of which are very intimately allied among themselves. Among these groups, certainly one of the most natural is that which composes the genus Cavia of Linnæus, at present divided into five natural genera, differing equally in the conformation of their organs of mastication and of locomotion. These are the capybara, (*Hydrochærus*, Brisson,) the pacas, (*Cælogenys, F. Cuvier,*) the moco, (*Kerodou*, F. Cuv.) the common cavies or guinea-pigs, (*Cavia*, Cuv.) and the agoutis, (*Dasyproctæ* and *Chloromys* of Naturalists.) Besides the large incisor or rodent teeth, the genera of this group have universally four molars in each side of each jaw, destitute of real roots, and penetrated by laminæ of enamel, which assume various forms, and appear marking the crowns of the teeth with divers irregular figures. This character, indeed, is not peculiar to the caviform rodentia, but is equally apparent in the porcupines, couendous, and other genera of the same order, but the number and form of the toes is, as far as we are aware, altogether peculiar to the present group. These are, four on the fore feet, and three on the hind, a combination only found in one other mammal, the tapir; and so invariable and essential does this character appear to be among the cavies, that the only instance in which the general rule admits of exception, is the case of the pacas, which have two small additional toes before and one behind: the supernumerary toes are mere rudiments, of no use in the functions of locomotion and prehension. Even in the qualities of their hair, these animals agree with one another, and differ from the generality of other rodentia; and their habits and economy are in most respects alike: the hair is universally of a coarse, bristly quality; they inhabit the hotter parts of South America and the West Indian Islands, and are most especially fond of low, marshy situations, and the banks of inland lakes, and rivers.

The most prominent zoological characters of the Agoutis are found in the nature and conformation of the feet and toes. The toes are provided with large powerful claws, and yet the animals make no use of them in digging or burrowing; they are pretty long and perfectly separate from one another, enabling them to hold their food between their fore-paws, and in this manner to convey it to their mouth. Like all other animals which are thus accustomed to use the fore-paws as hands, they have a habit of sitting upright upon their hind quarters to eat, and frequently also assume the same position when they would look around them, or are surprised by any unusual sound or occurrence. Their food is exclusively of a vegetable nature, and consists most commonly of wild yams, potatoes, and other tuberous roots in the islands of the different West India groups, they are particularly destructive to the sugar-cane, of the roots of which they are extremely fond. The planters employ every artifice for destroying them, so that at present they have become comparatively rare in the sugar islands, though on the first settlement of the Antilles and Bahamas, they are said to have swarmed in such countless multitudes, as to have constituted the principal article of food for the Indians. They were the largest quadrupeds indigenous in these islands upon their first discovery. The same rule of geographical distribution holds good generally in other cases; viz., that where groups of islands are detached at some distance from the mainland of a particular continent, the smaller species of inhabitants are usually found spread over both, whilst the larger and more bulky are confined to the mainland alone, and are never found to be indigenous in the small insulated lands.

Though the Agoutis use their fore-paws as hands to hold their food whilst they eat, yet their toes are nevertheless rigid and inflexible, and their claws large, blunt and nearly straight. They are consequently deprived of the power of ascending trees; and as they also do not construct burrows they wander at large among the woods, sheltering themselves beneath fallen timber, or in the hollow of some decayed tree. Here they produce and nurture their young, bringing forth, according to some accounts, three or four times in the year; according to others, never having more than a single litter in the same season, and even that consisting of not more than two or three individuals. It is probable, however, from the amazing numbers of these animals found in all the hotter parts of South America, notwithstanding the destruction made among them by small carnivorous animals, as well as by the Indians, and likewise from the close affinity which they bear to the hare and rabbit of our own country, that the Agoutis are tolerably prolific. The young are brought forth with the eyes closed, as in the case of most of the rodentia and the carnivora; but they are covered with hair, or rather small bristles, of the same colour as the mother: they soon acquire the use of their limbs and members, and learn to shift for themselves.

The hind legs of the Agoutis are considerably longer than the fore, and their pace is tolerably rapid for a short distance. But they seldom trust to speed of foot for their safety, but seek for shelter and security in the first hollow tree, or under the first rock they meet with. Here they allow themselves to be captured, without any other complaint or resistance, than the emission of a sharp plaintive note. The head of the Agouti is large, the forehead and face convex, the nose swollen and tuberous, the ears round, short, and nearly naked, and the eyes large and black. The hair is annulated in different degrees, with black, yellow, and green; it is generally coarse and bristly, like the weak spines of a hedgehog, though in one species it approaches in fineness to the fur of the rabbit; the tail is most commonly a mere naked stump or tubercle, which in the acouchy alone attains any apparent length, and is covered with a few short scattered hairs. The teeth are twenty in all; namely two incisors and eight molars, four on each side, in each jaw. The latter are all nearly of the same size, oval in figure, and with flat crowns, which exhibit the different convolutions of the enamel, as it penetrates the softer materials of which the body of the tooth is composed. It is impossible from mere description to convey an idea of the intricate figures which these convolutions assume; and we, therefore, refer to the annexed figure, where *a* and *b* represent respectively the upper and lower jaws, and the figures 1, 2, and 3, the appearances of the teeth at different ages, or after different degrees of trituration: No. 3, representing the teeth shortly after they begin to wear, No. 2, their intermediate state, and No. 1, when very much worn. This system, it will be observed, is exclusively adapted to a vegetable food; it is essentially formed for grinding and bruising, not for cutting and tearing: the stomach and intestines, therefore, which are always in harmony with the organs of mastication, are fitted only for the digestion of vegetable substances. The flesh of these animals is white and tender; it is a very common and favourite article of food in South America, and is dressed like hare or rabbit. There are four species distinctly known, and one alluded to by M. F. Cuvier in his treatise *Des Dents des Mammifères*, but of which we have no further knowledge nor description.



[Teeth of the Agouti, from Cuvier's *Dents des Mammifères*.]

1. The common Agouti, (*Dasyprocta Acuti*,) sometimes called the olive cavy, from the prevalent colour of its back and shoulders, is the size of a middling hare, being one foot eight inches in length, and about eleven or twelve inches high at the croup. The head resembles that of the rabbit, the nose is thick and swollen, the face arched, the upper lip divided, the ears round and naked, the eyes large, the upper jaw considerably longer than the lower, and the tail a naked flesh-coloured stump. The hairs of the upper and fore parts of the body are annulated with brown, yellow, and black, which give the animal a speckled yellow and green appearance on the neck, head, back, and sides; on the croup, however, they are of a uniform golden yellow, much longer than on any other part of the body, and directed backwards; the breast, belly, and inner face of the forearms and thighs are light straw colour, and the moustaches

and feet black. The general length of the hair on the upper and anterior parts of the body is about an inch, that of the croup is upwards of four inches long, and all, excepting the short coarse fur of the legs and feet, and that on the breast and belly, is of a stiff, harsh nature, partaking more of the quality of bristles than of simple hair.

2. The black Agouti, (*Dasyprocta Cristata,*) is rather improperly called the crested agouti, by M. Geoffroy St. Hilaire, since the hairs of its head and neck do not exceed those of the shoulders and back in length. It is considerably smaller than the common agouti, being about the size of a rabbit, whilst that species approaches the dimensions of the hare.

[Black Agouti, from F. Cuvier.]

Its general proportions and form, however, are the same, but the hairs of the back and sides, instead of being annulated with various-coloured rings as in that species, are nearly uniform black, whilst the long hairs of the croup are perfectly so; the belly and legs are equally covered with short dark hair. There is not any appearance of crest, and the tail is still shorter than in the common agouti. M. Cuvier in the *Règne Animal,* considers this species to be the female of the former, and M. Desmarest has marked it with an asterisk, as considering the question doubtful. Males and females, however, of both species have lived in the gardens of the Zoological Society for the last three years, without undergoing any change in colour or appearance, thus proving beyond a doubt that they are distinct species. It appears also from the observations of MM. Desmarest and F. Cuvier, made upon two individuals which were formerly possessed by the menagerie of the Jardin des Plantes, that the black agouti has but six mammæ, whilst the other species (the common) is reported to have twelve. Both seem to inhabit the same climates, Surinam, Guyana, and Brazil; the common agouti, however, appearing to have a rather more extensive range, and to be likewise found in the West India islands, and even as far south as Paraguay.

3. The Acouchy (*Dasyprocta Acuchi*) is considerably smaller than either of the foregoing species, and is at once distinguished by the greater length of its tail, which is upwards of two inches in length, not much thicker than a crow's quill, and covered with short scattered hairs like those on the tail of a rat. In other respects it is of the same form as the Agoutis; has the same naked round ears, the same large black eyes, and the same olive-green colour mixed with yellow and black. The hairs of the croup are not so long as in the Agoutis, but are perfectly black, and all the under parts of the body, the breast, belly, and interior of the arms and thighs, straw-coloured with a tinge of red. The hair of the legs and feet is short and black, and that of the body much finer in quality than the hair of the Agoutis. Stedman informs us that this species is very rare in Surinam: in Guyana it is more common, though less so than the Agouti, and according to the report of De la Borde is there called a rabbit, whilst the Agouti is denominated the hare. It also inhabits the islands of St. Lucia and Grenada, lives in the woods like the Agoutis, but its flesh is said to be insipid and dry.

[The Acouchy, from Buffon.]

4. The Mara or Patagonian Cavy (*Dasyprocta Patachonica*) is an animal as yet but imperfectly known to naturalists, and seems, from many details of its description, to form the connecting link between the present genus and the Chinchillas and Lagostomys. It is considerably larger than the Agoutis, measuring two feet six inches in length, and one foot seven or eight inches high at the croup. The ears also are essentially different, being three inches and a half in length, erect and pointed; and this circumstance, together with the length and elevation of the legs, gives the mara more the appearance of a small stag or antelope, than of a rodent animal. The hair also is materially different from that of the Agoutis, and approaches in texture and quality to the fine rich furs of the Bischaco and Chinchilla. On the head, shoulders, and back, it is greyish-fawn colour mottled with white, darker on the loins and hips, and terminating in a well defined curve over the croup, within which the colour is almost a jet black. All the under parts of the body are white; and this colour is separated from the greyish-fawn of the back and sides by a yellowish band, which passes along the flanks as in certain antelopes and gazelles. Under the chin and on the throat the colour is white, and there is a band of the same colour, and of a semicircular form, situated between the back and the hinder part of the thigh, above the groin, and surrounding the dark colour of the croup. The male and female are in all respects alike; the latter has four mammæ, and is said to bring forth but two young ones at a litter, which she conceals in the warrens of the Bischaco, till they acquire strength to follow her abroad and learn to shift for themselves.

[Patagonian Cavy, from Lesson.]

This species inhabits the open plains and wilds of Patagonia, as far south as the Straits of Magellan, where, according to M. Lesson, it is called Mara by the natives. It is often mentioned as a hare in the voyages of Sir John Narborough, Commodore Byron, and other navigators, who found it in great plenty about Port Desire, on the eastern coast, and to whom its flesh was a welcome and wholesome substitute for the dried and salt provisions, which formerly composed the only food of the sailor. The maras are said to go in pairs, to keep entirely in the open pampas or plains; they never form burrows, but couch in a lair by the side of some plant or shrub, run with great velocity for a short distance, but are easily fatigued. In the pampas, south of Buenos Ayres, Azara informs us that they are pursued on horseback, and killed with two heavy iron balls connected by a long cord, which the natives are very expert in throwing, and seldom miss their aim.

AGRA, CITY. The capital city of the province of Agra is situated on the south-west bank of the river Jumna, 27° 12′ N. lat. and 77° 56′ E. long. It was originally an inconsiderable village, but in the beginning of the sixteenth century was much enlarged by the Emperor Sekunder Lody, who bestowed on it the rank of an imperial city and made it the capital of his dominions, under the name of Badulghur. Half a century later, the city was further enlarged by the Emperor Akbar, who built here an extensive palace, and again changed its name to Akbarabad. This city continued to be the seat of the Mogul government until the year 1647, when Delhi was declared the capital by the Emperor Shah Jehan, from which period the decline of Agra may be dated. Shah Jehan, during his residence at Akbarabad, built a most superb mausoleum, as the cemetery of his favourite wife the Begum Noor-Jehan, about three miles from the city. This building, which is called the tâge-mahal, or crown of edifices, is composed of white marble, and is raised on an elevated terrace of white and yellow marble. It contains a central hall, within which are the tombs of the Begum and of Shah-Jehan himself, and around this hall are several smaller apartments and corridors. This mausoleum, the finest probably in the world, is said to have cost 750,000*l.*; it is kept by the British government in excellent order, together with its beautiful garden of trees and flowering shrubs. In this respect it contrasts favourably with the condition of the city, which is, for the most part, in a ruinous state,—the splendid palace of Akbar 'being used as warehouses, armories, offices, and lodging-rooms for the garrison.'

The houses in Agra are built of stone, and are very lofty, while the streets are so narrow as scarcely to allow a carriage to pass through them. The city contains many public baths, caravanseries, and mosques.

Agra was taken, in 1784, by the Mahratta chief Madajee Scindiah, and was retained by him until 1803, when it was captured, after a siege, by the forces under Lord Lake. It is now the seat of British government for the province. The Hindoo inhabitants hold the city in great veneration, as the place of the *avatâra*, or incarnation of *Vishnu*, under the name of Parasu Rama. Agra is one hundred and thirty miles, travelling distance, from Delhi, and eight hundred and thirty miles from Calcutta by way of Berbhoum.

AGRA, PROVINCE, a soubah or province of Central India, bounded, on the north, by Delhi; on the south, by Malwah; on the east, by Oude and Allahabad; and on the west, by Ajmeer. It lies between 25° 35′ and 28° 18′ north latitude. Its length is about 250, and its breadth about 180 miles. The province is divided into thirteen circars, or districts, viz., Agra, Calpy, Kanage, Cowl, Gualior, Irej, Sanwan, Narwar, Mundlayer, Alvar, Tejareh, Narnoul, and Sehar; and these districts are subdivided into 203 pergunnahs, or hundreds, containing, together, 40 considerable towns and about 340 villages. The chief towns and fortresses are Alvar, Bhurtpoor, Deeg, Mathura, or Muttra, Etaweh, Gualior, Gohud, Calpy, and Narwar. In the *Institutes of Akbar*, compiled by Abul Fazl, in 1582, it is stated, that the revenue of the soubah of Agra amounted to about 1,615,625*l.* sterling, and that it furnished 50,600 cavalry, 477,570 infantry, and 221 elephants. The chief rivers of the province are the Ganges, the Jumna, and the Chumbul. There are also some smaller streams; yet the country is but ill-supplied with water, and except in the immediate neighbourhood of the rivers, the water required for agricultural purposes must, in the dry season, be procured from wells. For this reason rice is but little cultivated. North of the Chumbul, the country is, for the most part, flat and badly timbered; but, on the other side of that river, and towards the north-western quarter of the province, the surface is somewhat hilly and more plentifully covered with trees. The climate, during a part of the year, approaches to temperate, and in the winter months may even be pronounced cold; but during the prevalence of hot winds, to which the whole of Central India is occasionally liable, the heat is insupportably great, and the climate, in consequence, unfavourable to European constitutions. These winds are seldom of long continuance.

The soil is, in general, particularly well adapted for the production of indigo, the cultivation of which may be extended almost indefinitely; the same may be said of sugar and cotton. The country between the Ganges and the Jumna, called the Dou-ab, is the most fertile part of the province, and furnishes all these articles for export.

There are but few mineral productions to be noticed in the province. It is said that copper has been discovered, but not under circumstances favourable to the working of the mines. There are marble quarries in the vicinity of Futtehpore. The breed of horses is superior to those of Bengal, and the more southern and eastern provinces. A good deal of coarse cloth is manufactured, principally for home use, in several of the circars; fine muslins and silks were formerly made, but these branches of industry have now much diminished.

Agra is not so thickly peopled as Bengal. It is said to contain not more than 6,000,000 inhabitants. All the territory which lies to the east of the Jumna, together with the city of Agra and a small district round the same, are in the immediate possession of the East India Company. The country north of the Chumbul is held by rajahs or native chiefs, in strict alliance with the British. South of that river, the territory is mostly held by, or tributary to, the Mahrattas. The natives are, for the most part, a handsome and robust race, and superior, in these respects, to the Bengalese. They are composed of a mixture of Hindoos and Mohammedans. Hindostannee is the language used in common intercourse, but the Persian is the official tongue, and is spoken by the higher class of Mohammedans.

AGRAM, a fortified town on an eminence near the Save, 45° 49′ N. lat., 16° 1′ E. long. It is about 150 miles nearly due south of Vienna. Agram is the chief town of Austrian CROATIA, and the residence of the Viceroy of Croatia and Slavonia. The town consists of three parts, the upper, the lower, and the part called Opatowina. It is the seat of a bishop, has an academy, a grammar-school, and a convent of Franciscans. Agram carries on some trade along the Save, which joins the Danube at Belgrade; and is also the great market for the sale of Hungarian wheat and tobacco, and Bosnian pigs. The population is stated at above 17,000.

AGRARIAN LAW was the general title of any law among the Romans which related to the *ager publicus*, or public domain. As the subject of agrarian laws constitutes perhaps the most important element in the history of the Roman republic, and as an utter misconception of their application has pervaded, till of late years, every work upon the subject, especially the popular writings of Hooke, Ferguson, &c., it seems desirable to place before the general reader a brief account of those more correct views which have been established by the researches of Heyne, Niebuhr, and Savigny.

Ever since the revival of letters it has been a universal error to look upon the agrarian laws, with which the names of the Gracchi and others were connected, as attempts to limit the amount of landed property that any individual might hold; and such an interference with private rights would indeed afford strong ground for condemning any statesman who could be the author of such a proposition; and any state where such a proposition could be favourably received. In the frenzy of the great French Revolution, there were indeed political fanatics, who, following the advice of Macchiavelli and Montesquieu, were willing to enact an agrarian law of this extravagant nature; and so much stress was laid upon the examples of Roman history, that Heyne, in March 1793, availed himself of the opportunity offered to him by the installation of a new prorector in the University of Göttingen, to address to that body a paper entitled *Leges agrariæ pestiferæ et execrabiles*, (see his *Opuscula*, vol. iv. p. 351,) in which he successfully contended that the laws so called among the Romans, instead of interfering with private property, solely applied to the lands of the public domain. Heeren and Hegewisch carried the inquiry further; but for the fullest and most satisfactory investigation of the whole subject we are indebted to Niebuhr and his friend Savigny.

As the victorious arms of the Romans extended their authority over one state of Italy after another, the right of conquest gave them a title to the lands of the conquered; but, except in cases of strong provocation, as in the defection of Capua in the second Punic war, it became the clemency of the conquerors to restore a part of the territory to the unfortunate owners. Yet a portion would perhaps always be reserved and added to the public domain. With regard to the disposition of the territory so acquired, we will not go back to an earlier date than the Servian constitution, which gave to the *plebes* or commonalty a share in the government, though an inferior one, with the patricians. The disposition of the conquered land was then, we may perhaps say, fourfold. Part was given in full property to religious uses, and part was sold by the quæstors for the supply of the treasury. The plebeians, who constituted the most important part of the army, received assignments of fixed and equal portions in full ownership, never perhaps exceeding seven jugers (*i. e.* between four and five acres) to each individual. These lands were often given under the form of a colony, the parent state sending a body of the citizens to occupy some conquered town, or to found a new one. In all cases the boundaries of lands so assigned were marked out according to the strict principles of Roman limitation, and placed under the religious sanction of the augury. But a large portion of the territory which fell into the hands of the conquerors in the issue of a successful war must often have been in a state of utter desolation, for devastation by fire and sword was a constant and leading feature in ancient warfare; and in a country where the olive and the vine form an important branch of agriculture, such desolation was not easily repaired. Thus large districts were unfit for distribution among the plebeians, or for sale by the quæstors. Moreover, much of the mountain land, and even of the unhealthy plains in Italy, was, as it still is, adapted solely for pasturage, and therefore equally unfit for partition, though far superior in immediate value. The disposition of this unappropriated land, which constituted the permanent public domain, led to a singular mode of occupation. An edict was issued, giving authority, most probably to the patricians alone, to cultivate these lands, but with the full understanding that the state reserved to itself the ownership, and might at any time resume possession,—a right which was from time to time exercised. Yet, though the occupants had no title whatever as against the state, they appear to have been protected against individuals by the interdicts of the prætor, and a branch of law entitled *caussæ possessionum.* Under this protection these lands often passed from father to son by a species of permitted inheritance, or as dowries to daughters, or were even transferred to other citizens by purchase; and in this way even plebeians, it would appear, might come into the occupation of them. But, no matter through how many hands the lands might pass, the tenure to the last occupier was as precarious as to the first; and, of course, this was always taken into account in estimating the value. On the other hand, the occupier was subject to certain restrictions and payments. He could not legally hold, at least after the Licinian law, more than 500 jugers (about 333 acres) of this public land; on the public pastures he was limited to 100 head of great, and 500 of small cattle; and he was bound to employ a fixed number of freemen. Some of these restrictions indeed did not always exist, but it seems highly improbable that some regulations of the kind should not have existed from the very beginning, if only to protect one patrician from another. But whatever doubt there may be on this subject, the state was always entitled to the payment of a tenth upon all grain, and a fifth on the olives and the wine, besides some charge, we know not how determined, for the use of the common pasture land. The technical terms used with regard to these possessions were as follows: the lands themselves were called *agri occupati, a. occupatorii, a. possessi, a. concessi, a. arcifinales,* or generally *possessiones.* The holder or *possessor* was said to have the *usus* of them; and the payment he made to the state was the *fructus* or *vectigal.* Instead of collecting this branch of the revenue directly, it was the practice to farm it out, which was expressed by selling or letting the *jus vectigalis* or *fructus;* and in the same sense they used the phrase *agrum fruendum locare,* or even more briefly, though somewhat ambiguously, *agrum locare.*

It must be confessed, indeed, that in this view of the first occupancy of the public domain, there is still something to be cleared up; for a mere edict, such as we have spoken of, without qualification or restriction, would have been little better than an invitation to a general scramble. Yet, however this may be, it is established incontrovertibly that the possession was simply permissive. If the original occupancy was founded in collusion, the case against the patricians will only be the stronger.

In the various usurpations of the patrician body the restrictions enumerated above were little attended to. The vectigal was rarely paid. While the plebeian was serving in the army abroad, the portion of the public domain possessed by him—and this could only be through purchase—was violently or fraudulently seized by a powerful neighbour. Large districts were monopolized by single holders. It was by them found more profitable to cultivate the land by slaves than by freemen, who were always liable and often called upon to perform military service. Those who held the chief power in the government conspired to deny the title of the state to resume their possessions; and even when new conquests added to the domain, the most desperate efforts were made to resist all further assignments of land to the plebeians, that is, to the very veterans who had effected the conquests. To redress these grievances, or rather to moderate them, agrarian laws were from time to time brought forward; but, we repeat, these laws never interfered with private property. The wealthy might hold land really their own to any amount. The sole object which the reformers had before them was to check usurpations of the public domain.

We cannot trace the subject historically through the whole existence of the republic, but a few remarks may still be useful. If we look at the birth, the station, the conduct, and the character of the distinguished men whose names are connected with the promulgation of agrarian laws, we shall find little reason for considering them as demagogues. Spurius Cassius indeed lived in a time when we can place little reliance upon the truth of Roman history; but he was himself a patrician, he had thrice been consul, and had thrice triumphed; and though he was eventually tried and executed for treason, the trial took place not before a plebeian court, as is generally stated, but, as Niebuhr has established, in the *Comitia Curiata,* where the patricians themselves, whose usurpations he had contended against, were at once his accusers and his judges. For understanding the true character of Licinius Stolo, and the wisdom and justice of his legislation, we will only refer to the forthcoming number of Niebuhr's third volume. In the time of the Gracchi, it may be thought by many that injustice and tyranny had obtained a title by prescription; but though there may be a question about the policy of the reforms they were endeavouring to introduce, no candid reader of Roman history can doubt the purity of their intentions, or the baseness of the majority among those who resisted them by revolution and assassination. Except the presumed guilt of supporting these agrarian laws, not even their enemies could find a blot in the characters of the two sons of the virtuous Cornelia. Velleius was no friend to democrats, but he says, speaking of the elder Gracchus, *Vir alioqui vita innocentissimus, ingenio florentissimus, proposito sanctissimus, tantis denique adornatus virtutibus, quantas perfecta et natura et industria mortalis conditio recipit.*—('A man in other respects (*i. e.* except in his opposition to the usurpations of the patricians) as to his life most blameless, in ability most distinguished, in principle most upright, in fine adorned with every virtue in as high a degree as man can attain to, when the best gifts of nature are improved by discipline.')—At the same time his opponent Octavius, and his murderer the Pontifex Maximus, Scipio Nasico, were actually offenders under the very law which Tiberius was endeavouring to enforce. On the other hand, the consul Opimius, who headed his party in the premeditated massacre of the younger Gracchus and three thousand of his defenceless countrymen, and then erected a temple to Concord, was afterwards convicted of sacrificing the interests of his country for the gold of Jugurtha. For a full examination of the agrarian laws of Rome, see Niebuhr's *History,* translation by Hare and Thirlwall, vol. ii., pp. 129—173; and among the ancient writers, Appian's *Civil Wars,* book i. c. 7—27; Plutarch's *Lives of the Gracchi;* Dionysius and Livy; Cicero's speech against Rullus, &c.

AGREEMENT, a mutual bargain, contract, or covenant. In its most extended sense, it comprehends a large proportion of the transactions of civilized man in the mutual intercourse of society, and may even be said to form the basis of civil society itself. In a more limited sense, it gives rise to those obligations which it is the object of all government to enforce. The following is a short outline of the law of England, in reference to the latter class of contracts: it may, however, be noticed that, as it appears to be founded, for the most part, on the obvious wants of society and the ordinary maxims of natural justice, its provisions will be found to coincide, in their general features, with the laws of civilized communities.

1. *Assent* is the essence of an agreement: hence the parties to a legal and valid contract must be in a situation to testify their free assent to it. Thus lunatics, infants, and married women are, for obvious reasons, deemed incapable of binding themselves by any engagement. In some few transactions of urgent necessity,—as in the purchase, for example, of those articles which nature, or the conventional usages of society, have rendered fit and necessary, the contracts of the two former classes of persons are obligatory on them; or, in the case of a married woman, on her husband. In the same manner, fraud, intimidation, or other undue advantage taken by the party who has attempted to secure to himself a benefit by an agreement, will discharge the party who, from ignorance or the operation of external force, has yielded an apparent assent to it.

2. The *subject* of agreement must not be tainted with illegality; for it would be evidently repugnant to common sense that the law should be called upon to enforce perform-

ance of any act which it has expressly forbidden, or which contravenes its general policy.

3. An agreement, in order to secure the aid of the law in carrying it into effect, must have certain qualities mutually beneficial to the parties, or must be entered into with certain prescribed solemnities. Courts of justice cannot be called upon to give effect to every idle or inconsiderate promise. An agreement must either be contracted by a formal instrument in writing, sealed and openly acknowledged by the party who has bound himself by it, and which is technically called a *deed*, or *specialty contract;* or if contracted in a less formal manner, by word or otherwise, it must appear that the parties derive from it reciprocal benefit. This is the meaning of lawyers when they affirm that a *parole* agreement (*i. e.* an agreement not contained in a deed) cannot be legally enforced, unless there be a sufficient *consideration* to support it. Thus A. cannot found legal proceedings against B., in respect of any promise made by B. to A., unless by the terms of the original agreement A. was either to confer some reciprocal advantage upon B., or was to put himself to some specific disadvantage at B.'s request. Upon this principle it is that, by our law, a promise to make a voluntary gift can never be enforced; but there is a continuing right, in the party promising, to retract his promised donation, until the gift is actually completed. An agreement, thus defective for want of consideration, is called a '*nudum pactum,*'—a phrase borrowed from the Roman law, though used in a sense somewhat different from that which it bears in the Roman code.

4. The *form* of agreements has in some cases been regulated by positive law. The most remarkable instance is that which was introduced by the Statute of Frauds, in the reign of Charles II.; by which it is enacted that contracts, in certain cases, shall not be available, unless there be some memorandum or note of them in writing, duly signed by the parties to be charged, or their agents. Doubts have been entertained on the efficacy of this provision in the prevention of frauds; yet similar precautions have, we believe, been adopted in other countries, and the legislature has, in our own time, been induced to extend its application to cases not within the scope of the original statute.

The rules respecting the *construction* of agreements; the various modes by which parties may be released from the performance of them; and the circumstances under which they may excuse or justify non-performance, belong rather to works exclusively adapted to legal students than to a sketch like the present.

With regard to the mode of enforcing agreements, the law has provided two different remedies, to which the injured party may resort, according to the nature of his case. He may either seek a pecuniary compensation for the breach of the agreement in the courts of common law; or, in cases where such compensation is inappropriate, he may obtain from the courts of equity a decree that the party offending shall perform his agreement specifically.

See further Blackstone's *Comm.*, b. ii., c. 30.—Fonblanque's *Treatise of Equity*, vol. i.—Bacon's *Abridgment*, tit. '*Agreement.*'

AGRICOLA (CNÆUS JULIUS) was born on the 13th of June, in the year 38 A. D., at Forum Julii, now Fréjus, a city at that period of considerable celebrity. (See FREJUS.) The father of Agricola was Julius Græcinus, a writer of some eminence on agriculture, and distinguished, as a senator, both for his eloquence and his integrity. But his virtues were the cause of his destruction. The emperor Caligula being desirous to get rid of his father-in-law, M. Silanus, called upon Græcinus to undertake the accusation which was to be the pretext for his destruction. This disgrace Græcinus refused to incur, and consequently he met with the same fate as the unfortunate Silanus. Agricola was an infant at the time of his father's death. His mother was Julia Procilla, and thus on both sides Agricola was connected with the Julian house. This fact, however, affords no evidence of any connexion by blood; and it is most probable that the name was originally obtained by the ancestors of Agricola as freedmen of Julius Cæsar, or Augustus. We find them at any rate connected with a colony, Forum Julii, which appears to have been founded by the former, for it existed in the time of Cicero; and again the grandfathers of Agricola on both sides held the dignity of procurator or chief fiscal officer in the provinces, which was not uncommonly bestowed on the favourite freedmen of the Cæsars. After receiving his education at Massilia, (Marseilles,) the principal seat of learning in Gaul, he was sent to Britain, where he served under the immediate eye of Suetonius Paulinus, one of the ablest generals of Rome; and his service in this island included perhaps the most critical period during the whole Roman occupancy, viz., the grand insurrection under Boadicea (61 A. D.), when, availing herself of the absence of Suetonius in his attack upon the sacred island of the Druids (Anglesey), she fell upon the three chief settlements of the Romans—Camalodunum (commonly supposed to be Maldon in Essex), St. Albans, London, and massacred seventy thousand men; for which Suetonius soon after exacted ample vengeance. In 62 he returned to Rome, where he married Domitia Decidiana, a lady belonging to one of the first families. He was now elected quæstor, and received Asia for his province, the wealth of which too often tempted the cupidity of Roman officers: and, on the present occasion, the Proconsul Salvius Titianus (a brother of the future emperor Otho) would willingly have made a compromise with his quæstor for mutual impunity; but Agricola did not yield to the temptation. During the latter part of Nero's reign distinction was dangerous, and Agricola, well knowing the jealousy of the emperor, endeavoured—even when holding the offices of tribune and prætor—to avoid all appearance of ostentation and ambition. On the accession of Galba (68) he was selected as a commissioner to examine the state of the treasures belonging to the temples, and to restore to them whatever had been taken away; for under Nero the valuable gifts consecrated in the temples had been repeatedly seized to fill the empty coffers of the prince. How far Agricola was engaged in the civil contests which ensued between Otho and Vitellius does not appear. At the outset of this war his mother was murdered by a detachment from Otho's fleet which landed in Liguria, and ravaged the property of the family near Intemelium (Vintimiglia). As Agricola was hastening to pay the last offices to his mother, he learned that Vespasian had been proclaimed by the legions in the east. He instantly declared in his favour, and was soon rewarded by the command of the twentieth legion in Britain. On his return to Rome (about 73) he was enrolled by the emperor among the patricians, and soon after appointed governor of Aquitania, a province which, since the distribution of the empire made by Augustus, included all the south-western part of Gallia, from the Pyrenees to the Loire. This appointment he held for nearly three years, and his successful administration of this peaceable province proved him to possess abilities beyond those of a mere soldier. He was recalled to receive the still higher honour of the consulship. His daughter, born during his quæstorship in Asia, was now betrothed to the celebrated historian, C. Cornelius Tacitus, and the next year she was given to him in marriage. Agricola, at the expiration of his consulship, was appointed governor in chief of the island where he had already twice served in an inferior capacity. He proceeded thither about the year 78, but the date cannot be fixed with any certainty. During his last absence from Britain the command had been in the hands of Petilius Cerialis and Julius Frontinus, the former of whom had subdued a part of the territory of the Brigantes (Yorkshire, Lancashire, &c.), and the latter had entirely reduced the Silures in South Wales. Agricola passed seven or perhaps eight summers in Britain; in the first of which he added North Wales and the sacred island of Anglesey to the Roman province. By the end of the fourth campaign, the whole island south of the Clyde and the Forth was secured to the Romans by a line of forts running from the one æstuary to the other. Every summer extended the dominion of the Roman arms, but it was only in the last year of his government that he entirely broke the spirit of the Britons, by the defeat of Galgacus on the Grampian hills. At the close of this campaign, a Roman fleet, for the first time, sailed round the island, as if to mark the extended boundary of the Roman empire. The splendid successes of Agricola were, however, unpalatable to the suspicious Domitian, who could not fail to observe how ready the people would be to contrast them with his own pretended victories over the Germans. Agricola was honourably recalled, under the pretext of being sent as governor to Syria. By order of Domitian he entered Rome at night, and after a cold reception by the emperor he quietly retired into private life. When his consular rank a few years after entitled him to the proconsulship of Asia or Africa, he wisely declined an appointment which had been fatal to the previous possessor. He died on the 1st of September, A. D. 93, in the fifty-sixth year of his age, not without some suspicion of poison. His property was left between his wife Domitia, his only child, (married, as we have already said to Tacitus,) and the emperor Domitian. The latter appeared highly pleased at this mark of esteem, but, as the historian observes, a good father never bequeaths his property to a good prince. All that we know of Agricola, with the exception of a single chapter in Xiphilin (66. 20) which is very inaccurate, is from the pen of Tacitus.

AGRICOLA (RODOLPHUS), one of the most learned and remarkable men of the fifteenth century, was born at a village, variously written Bafflou, Baffeln, Bafflen, Baffel, or Baflo, two or three miles from Groningen in Friesland, about the end of August 1443, not in 1442 as often stated (see the inscription on his tombstone as given in M. Adam's *Apograph. Monument. Haidelburgens.* p. 22). In a short notice of Agricola by M. Guizot, in the *Biographie Universelle*, it is said, but we do not know upon what authority, that his name was properly *Huesmann.* His first master is also there said to have been the famous Thomas à Kempis. After distinguishing himself at school, he proceeded to the college of Louvain, where he remained till he took his degree of M.A. He was then solicited to accept a professorship in that college; but he declined an office which would have prevented him from visiting the chief seats of learning in other countries. According to a custom common with the students of that age, he set out on his travels and came to Paris. After remaining here for some time, he proceeded to Italy, and arrived at Ferrara in 1476, where he resided during that and the following year, and attended the prelections of Theodore Gaza on the Greek language. He also extended his own reputation by giving a similar course on the language and literature of Rome. The favour of the duke, Hercules D Este, and the admiration of the most famous scholars of Italy were liberally bestowed upon the accomplished foreigner, who used to contend, we are told, in amicable rivalry with the younger Guarino in writing Latin prose, and with the Strozzis in verse. After visiting Rome and some of the other cities of Italy, he left that country, probably in 1479. On his return to Holland he appears to have occupied a chair for a short time in the university of Groningen, and he was also chosen a syndic of that city, in which capacity he spent about half a year at the court of the emperor Maximilian I. In the year 1482 he removed to Heidelberg on the invitation of Joannes Dalburgius, the bishop of Worms, whom he had taught Greek, and by whom he was appointed to one of the professorships in the university of Heidelberg. The remainder of his life seems to have been spent partly at Heidelberg and partly at Worms, where he lodged in the house of his friend the bishop. At the request of the Elector Palatine, who greatly delighted in his conversation, he composed a course of lectures on ancient history, which he delivered at Heidelberg, the Elector being one of his auditors. He also after coming to reside in the Palatinate, commenced the study of the Hebrew tongue, under the tuition of a converted Jew, whom his friend the bishop kept in his house for that purpose. In this new study Agricola had made great progress, when a sudden attack of illness carried him off at Heidelberg, on the 28th of October, 1485, at the early age of forty-two. There was certainly no literary name out of Italy so celebrated as that of Agricola during his age; and, if we except Politian and Mirandola, perhaps not even Italy could produce a scholar equal to him. The most eminent cultivators of classical learning in the next age have united in placing Agricola among the first of his contemporaries. We need only mention Cardinal Bembo, Ludovico Vives, the elder Scaliger, and, above all, Erasmus. Agricola indeed may be regarded as the immediate forerunner of the last great writer, and in some degree as the model on which he was formed. Agricola, in the same manner as Erasmus, appears to have clearly discerned many of the ecclesiastical abuses of his time, and to have anticipated the revolution in the opinions of men that was at hand, although he refrained from doing anything to urge on the crisis. If Agricola did not write Latin with all the exactness of Erasmus, his compositions are not less distinguished by a natural ease and perspicuity of style, and often by an eloquence which is altogether classic in spirit at least, if not in form. Erasmus has himself told us that in beauty of diction he placed him on a level with Politian, and in majesty before him. Besides his skill in ancient learning, Agricola was a skilful practitioner of the arts of music and painting. His collected works were published, as it is commonly stated, in two volumes 4to. at Cologne, in 1539, under the title of *R. Agricolae Lucubrationes aliquot, &c.* According to Gesner's *Bibliotheca Universalis*, and the *Bibliotheca Belgica* of Foppens, the principal contents of this collection are his three books De Inventione Dialectica, some letters, orations, and poems, and some translations from Aphthonius, Lucian, Isocrates, and other Greek authors. It does not appear to contain, as commonly stated, his abridgment of Universal History. The work De Inventione Dialectica is the most celebrated of Agricola's performances. It has been repeatedly printed with ample scholia; in 1534 a compendium of it, by Joannes Visorius, appeared at Paris; and an Italian translation of it was published in 4to. at Venice, in 1567, by Oratio Toscanella. It is considered to have been one of the earliest treatises which attempted to change the scholastic philosophy of the day. Morhof speaks of it as having anticipated in several respects the Logic of Peter Ramus. In the injunctions given by Henry VIII. to the University of Cambridge, in 1535, the Dialectics of Agricola and the genuine Logic of Aristotle are ordered to be taught instead of the works of Scotus and Barlæus; and in the statutes of Trinity College, Oxford, founded some years later, we find a similar recommendation. Besides the works already mentioned, the following authorities may be referred to for further information respecting Agricola; Bayle, *Dictionnaire;* Baillet, *Jugemens des Savans; Vitæ Germanorum Philosophorum*, a Melchiori Adamo;—*Vie d'Erasme*, par Burigny, Paris, 1757, vol. i., p. 17; *Vita R. Agricolæ*, autore Ger. Geldenhaurio Noviomago, in *Virorum eruditione et doctrina illustrium vitis*, Francfort, 1536, p. 83, &c. See also an interesting letter on the habits and character of Agricola, from Melancthon, dated Frankfort, 28 March, 1539, in the edition of Agricola's works published at Cologne.

AGRICULTURE. The important subject of the cultivation of the earth may be conveniently regarded in three distinct points of view, namely, practically, historically, and politically.

If we were to attempt, as is done in several *Cyclopædias*, to give a connected account of the practice, the history, and the statistics of Agriculture, many Numbers of this publication would be insufficient even for a slight sketch. We shall, therefore, only point out here some of the larger divisions in which the subject will be arranged.

1. The *Practice* will be found principally under the heads Arable Land, Draining, Farm, Grass Land, Live Stock, Orchards, Woods.

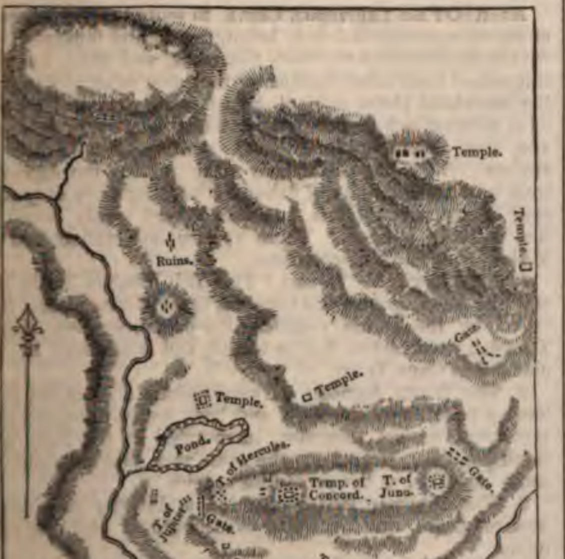
2. The *History* will be treated under the head British Husbandry, which will include a comparative account of the progress of other nations.

3. The *Statistics and Political Economy* will chiefly be embraced under the heads Corn-Laws, Cottage Allotments, Food of Labourers, French Economists, Markets, Poor-Laws, Rent, Tithes.

AGRIGENTUM, now called Girgenti, a Sicilian city, distinguished by the magnificence and gigantic size of its ruins, which bear certain testimony that the stories related of its extraordinary wealth in old times are not entirely without foundation. It was called by the Greeks Acragas, and by the Romans Agrigentum. It is situated on the southern coast of Sicily, about two and a half miles from the sea, 37° 17′ N. lat. 13° 28′ E. long. and was a colony from Gela, another city lying on the same coast, to the eastward, founded about Ol. 50, B.C. 580. We first hear of it in connexion with the well-known name of Phalaris, tyrant of Agrigentum, of whom many improbable stories are told. The duration of his power, variously stated by ancient authors, is placed by Dr. Bentley from Ol. 53, 4, to Ol. 57, 3 (B.C. 565 to 550). It seems that he was a prince of considerable ability, who, having made himself master of the state, like Pisistratus or Dionysius, was called *tyrant*, a word having in itself no signification of cruelty, but merely expressing the assumption of unconstitutional or absolute power. He was destroyed in a popular tumult, by a general attack of the people, (Cic. Off. ii. 7,) and after his death a democratical government was established for about sixty years, during which we find in extant history no mention of Agrigentum.

Anterior to the year 480, we find Theron ruling the city, with the title of prince, (δυνάστην, Diod. xi.) known by two odes of Pindar, composed in honour of victories gained by his chariots in the Olympic games. Theron was a mild and popular ruler. He reduced Himera, a town on the northern coast of Sicily, the tyrant of which, Terillus, sought help at Carthage, and gave occasion to the first important attempt of that city to extend its dominions in Sicily. A large army of Carthaginians passed over, and besieged Himera, but was defeated with great slaughter by the combined force of Agrigentum and Syracuse. A vast number of prisoners were taken and made slaves on this occasion, insomuch that it is stated, probably with some exaggeration, that 400 fell to the share of many individual citizens, and yet the greatest part were retained for the public use, and employed in those stupendous buildings, of which we still admire the remains. Theron died Ol. 77, 1, B.C. 472, and Thrasydæus, his son, a man of licentious and cruel temper, succeeded. He provoked a war with Syracuse, in which he was defeated, and his power probably being shaken, he was expelled by the Agrigentines, who again established a democracy.

When the Athenians invaded Sicily in the Peloponnesian war, Agrigentum remained neuter. We find few notices of it again till B.C. 408. At that time the city flourished, according to Diodorus, in wealth and luxury, such as no other state but Rome itself had exhibited. Of the means by which such wealth was acquired, we know nothing, except that extraordinary fertility is ascribed to the soil, and that the resort of foreigners makes it likely that it was a great commercial depôt. The number of citizens is stated by Diodorus (xiii.) at 20,000, and of foreigners settled there 180,000 more, a number probably much exaggerated. In B.C. 406, this prosperous city was again attacked by Carthage. The residents were supported by a body of Italian mercenaries, commanded by a Lacedæmonian, Dexippus; and a powerful diversion was made from without by Syracuse. But civil discord and insubordination rendered fruitless a resistance, which for some time was spirited, and might have been successful. The Carthaginians completed lines of circumvallation; and when the place was reduced to extremity by hunger, the bulk of the citizens passed the enemies' lines in a winter night, and reached Gela in safety. The town was preserved by Hamilcar or Imilcon, the Carthaginian general, for winter quarters, but razed in the following spring: the pictures, statues, and most valuable spoil was taken to Carthage, the rest sold. The vacant town and territory of Leontini was given by the Syracusans to the fugitives.



Agrigentum, from Capt. Smyth.

Of the subsequent history of Agrigentum only scattered notices remain. It is said, by Plutarch, to have been rebuilt by Timoleon, which must have been between the years B.C. 344 and 337. We find it stated, indeed, that the Agrigentines united with Dionysius the elder, when he declared war against Carthage, Ol. 95, 4. B.C. 397: but this may, perhaps, refer only to the Agrigentines established in Leontini. Ol. 117, 4. B.C. 309, they made an attempt to recover their ancient power in Sicily, and for a time seemed to prosper, but desisted from the attempt in the second year, in consequence of experiencing a defeat from the Syracusans. The prosperity of the city at a somewhat later period is rendered probable by a statement in Diodorus, (xxii. ecl. 14,) that Pyrrhus received from the Agrigentines 18,000 foot and 800 horse 'equal to the Epirot troops,' when they admitted him into their city, about B.C. 280. In the first Punic war the state adhered to Carthage. During the struggle in Sicily between the Carthaginians and Romans, it was taken, retaken, and taken again; and suffered very severely in all these changes. Little more is known of its history, and there would be no profit in attempting to combine the scattered notices of a city which never again filled an important part. For an account of the modern town, see GIRGENTI.

The situation of Agrigentum is said by Mr. Wilkins to be one of the most beautiful in Sicily. 'At the foot of the high mountains which bound the plains of the Acragas, a low ridge of hills extends from east to west. The southern side gently slopes towards the river, while the northern and western sides fall much more steeply towards the Hypsa, which still flows, though with a current much diminished.' (*Magna Græcia.*)

The most remarkable objects mentioned by Diodorus in his account of the town, (Book xiii. c. 82.) are the temple of Jupiter Olympius; and an artificial lake, seven stadia, or near a mile in circumference, and twenty cubits, or thirty feet deep, fed constantly by running streams, well stocked with fish, which were eaten at the public entertainments: the pond was also a favourite haunt of swans. This, before the time of the historian, was filled with mud, in consequence of neglect, and turned into orchard or garden ground, which afforded a considerable revenue to the town. He also mentions the tomb of Theron as a considerable work. The temple of Jupiter is said by Diodorus to have been the largest in the island: indeed, except the temple of Ephesus, it was the largest Grecian building applied to sacred purposes. Its dimensions, as given by him, are—height, exclusive of the platform, 120 feet; length 340; breadth 60. It was of the Doric order, but *apteral*, that is, it had no external portico, the interval between the columns being filled up by wall. This deviation from the general practice arose probably from the impossibility of finding stones large enough to serve as epistyles; for the distance from centre to centre of the columns being 30 feet, a series of masses of stone of that length, and of corresponding depth and thickness, would have been required, had not the superincumbent entablature been sustained by a continued wall. As it is, many blocks of the entablature weigh eight tons and upwards. The columns are *engaged*, that is, little more than half their mass projects from the wall. The circumference of the external and visible part is 20 feet, the diameter, as given by Mr. Cockerill, 13. Their proportions cannot be exactly ascertained; they are conjectured by Mr. Cockerill, from other examples at Agrigentum, to have been $4\frac{3}{4}$ diameters in height. The echinus of each (that is, the swelling part of the capital) was formed by two stones, each a quarter of the whole capital, had the pillar been disengaged. Two of them at least remain, each weighing (by computation we presume) $21\frac{1}{3}$ tons. These enormous masses were raised to the height of 70 feet from the ground. To the inside of the building, as Diodorus expresses it, they are square, and 12 feet in diameter, that is, there is a series of pilasters within, 12 feet broad, corresponding in position with the external columns. The columns were built in courses of masonry, not single blocks, so that in fact they formed an integral part of the wall. The flutings are said by Diodorus, and the account is verified by recent travellers, to be wide enough to contain a man in their hollow, as in a niche. When the town was first taken by the Carthaginians, the temple was completed except the roof, and this deficiency was never supplied. In the eastern pediment was sculptured the war of the Giants: in the western, the siege of Troy. Within, the temple was divided into what we may call a nave and two aisles; and it may assist the reader's comprehension to state, that according to Mr. Cockerill's measurements, (whose description of the temple, in the 4th vol. of Stuart's *Athens*, is the latest and best,) the height of the nave was 18 feet more than that of the nave of St. Paul's, and its breadth 2 ft. 2 in. greater. The walls of the interior were strengthened by massive pilasters, supporting an entablature upon which stood a row of *Atlantes*, as the Greeks called male figures when thus applied. These colossal figures were about 25 feet high, and supported an upper entablature, which rose about 110 feet above the floor of the temple. Fragments enough to restore one of these giants were collected by Mr. Cockerill. The width of the chest is more than 6 feet, the head is 3 ft. 11 in. high, and 3 ft. wide. The style of sculpture approaches that of the Æginetan marbles: the giants must, however, be considerably later in date. Fazellus says, that 'one part connected with three giants and some columns was long standing, but fell, December 9, 1301, and the common people still call the spot the Palace of the Giants.'

A thin coating of plaster, resembling the finest marble, covered the whole building. The breadth, as given by Diodorus, is clearly wrong, unless we suppose him to mean the cell, or nave of the building, in which case he is not very far from the true dimensions as ascertained by measurement. We may here remark, that some modern works give the height, as stated by Diodorus, at 220 feet. Wesseling, however, reads 120, and the other is so glaringly out of proportion, that there can be no doubt which is right. The dimensions, given in English feet by Mr. Cockerill, are—

	ft.	in.
Extreme length of basement	369	5
——— breadth	182	8
——— of cell	68	6
——— temple within the walls	142	6
Height of podium or basement	9	6
From the basement to the top of the capitals	61	6
Entablature	25	6
Tympanum	23	6
Total height	——120	

Of this splendid building, with the exception of the basement, scarce one stone remains above another. Traces of the walls, however, have been discovered by excavation, enough to enable the skilful architect to determine the ground-plan with accuracy. Not a single column remains standing, but two capitals are still visible on the ground,—one with a portion of the entablature attached,—which excite the wonder of the visiter by their gigantic size.

We have described at length this the most remarkable of the Agrigentine ruins in size and construction: of the others, we must speak very briefly—they differ little from other Greek remains. At the south-east angle of the ancient city, stood the remains of a temple formerly dedicated to Juno Lucina. Further to the west, stands the temple of Concord, in better preservation, owing to its having been converted into a Christian church. More recently it was restored according to the original design, by the late king of Naples. The portico is perfect, and the columns in good preservation. Both these temples are of the Doric order, and nearly of the same size and plan. Both are *peripteral*, or surrounded by a portico, consisting in each of six columns in front and thirteen on the side, and their dimensions are about the same—length 124 feet, breadth 54. They are situated on the immediate edge of an abrupt rock, and form most striking objects from the plain below. A good view of them and the surrounding scenery is to be seen in Mr. Wilkins' *Magna Græcia*. Of the temple of Hercules but one pillar remains; of that of Æsculapius, only three. The area of the fish-pond is still visible; it is now a garden, as in the time of Diodorus. The form is traceable, and the dimensions seem to be larger than those given by the historian. Other remains of antiquity exist, and among them, one is said to be the tomb of Theron; but there is nothing further to call for particular description.

Many stories of the extraordinary wealth and profuseness of the Agrigentines are told, which are not without interest; they may be summed up in the pithy observation of Empedocles, himself a native of the city, that 'the Agrigentines built as if they were to live for ever, and feasted as if they were to die on the morrow.'

AGRIMO'NIA is the name of a plant of the rose-tribe, to which the English give the name of herb agrimony. It is known from all the other genera of the same tribe by its having only two or three pistilla enclosed in the deep tube of its calyx, from seven to twenty stamens, and small-notched petals.

[Agrimonia Eupatoria.]

The common species, *Agrimonia eupatoria*, is an erect, hairy, herbaceous plant, frequent by the sides of hedges in fields, on the skirts of woods, and in similar situations all over England. Its lower leaves are interruptedly-pinnated, with the leaflets of an oval form, and coarsely serrated. When bruised, they yield a slight, but pleasant aromatic odour. The stem is nearly simple, and a foot and half or two feet high. The flowers, which are small and yellow, are succeeded by little bur-like fruits.

The leaves, which are astringent and aromatic, have been found useful in the preparation of fever-drinks, and for the cure of slight inflammation in the mouth or throat; on this account agrimony is always reckoned one of our wild medicinal plants, and is often employed as an ingredient in herb teas.

AGRIOPES (*Agriopus, Cuv.*), in ichthyology, a genus of acanthopterygious fishes, belonging to the family which M. Cuvier denominates *Joues Cuirassés*, and which are distinguished from other families of the same order, by having the suborbital plates extending backwards over the cheeks, so as to cover either the whole or the greater part of them, and thus defending them, as it were, with a buckler or cuirass. But what particularly distinguishes the Agriopes from most other genera of fishes, is that they have only nine rays in the pectoral fins, a number very rarely found in this class of animals. Three species are enumerated by MM. Cuvier and Volenciennes.

1. The *Agriopus Torvus*. This fish inhabits Table Bay and the seas around the Cape of Good Hope, where it is called by the Dutch colonists *Zee-paard*, or Sea Horse. This fish exceeds two feet in length, and is common in the markets of Cape Town.

2. The Warty Agriope, (*A. verrucosus*,) is so called from having the skin of the head and body entirely covered with prominent conical tubercles, surrounded at the base with small papillæ. It grows to the same size, and inhabits the same localities, as the preceding species.

3. The *Agriopus Peruvianus* is found in the neighbourhood of Lima, and grows to the length of eight or nine inches.

AGRIPPA (HENRY CORNELIUS) a remarkable personage, who may be ranked with his contemporaries, Paracelsus and Cardan, as at once a man of learning and talent, and a quack. It may be added that each of the three was probably to a certain extent the dupe of his own pretensions. Agrippa was born at Cologne, of a noble and ancient family, on the 14th of September, 1486. His first employment was as secretary at the court of the Emperor Maximilian, after which he served in the wars in Italy, where, having repeatedly signalized himself by his bravery, he obtained the honour of knighthood. About his twentieth year he seems to have assumed the character of a scholar, and to have commenced a wandering life. The profession which he took up was that of a physician; but he allowed himself also to be regarded as an alchemist, an astrologer, and even as a practitioner of magical arts. Not satisfied even with this extensive range, he thought proper to set up likewise for a great theologian, as well as to indulge himself with occasional excursions into other departments of literature and science. The effect in that age of all this pretension, supported as it was by unquestionable talent and by real acquirements of great extent, was to raise Agrippa, for a time at least, to high estimation and importance. Pressing invitations were sent to him by several crowned heads that he would enter into their service—by our Henry VIII. among the rest. He appears to have visited England before this, one of his pieces being dated from London in 1510. His excessive imprudence, however, was continually involving him in difficulties; and especially, having by some of the effusions of his satiric spirit provoked the enmity of the monks and the church, he experienced the consequences to the end of his days. After having led for many years what may almost be called a fugitive life, this singular character died at Grenoble, in 1535. He had been thrice married, and had several children. The works of Agrippa were published in two volumes, octavo, at Leyden, in 1550, and also at Lyons in 1600. The most remarkable of them, and the only one which is now remembered, is his Treatise *On the Vanity of the Sciences*, which is a caustic satire on the kinds of learning most in fashion in that age. Bayle has dedicated a very long article to Agrippa, to which we refer those of our readers who wish for more information respecting him. See also Gabriel Naudé's *Apology for the Great Men who have been suspected of Magic*.

AGRIPPA (HEROD, son of Aristobulus), king of Judea. [See HEROD.]

AGRIPPA (HEROD) son of the above. [See HEROD.]

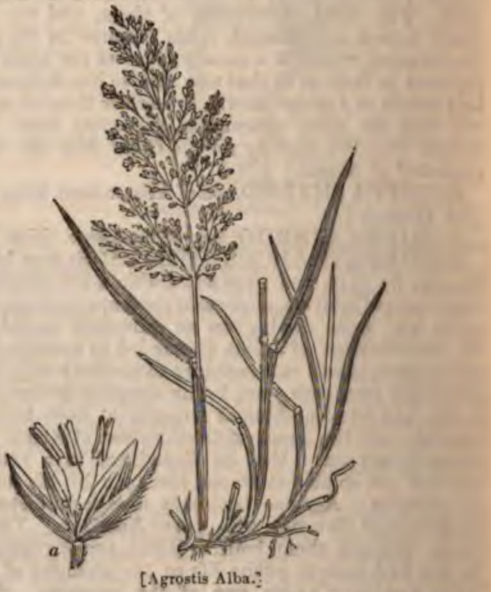
AGRIPPA (MARCUS VIPSANIUS) was born about the year 63 B. C., and thus was within a few months of the same age as Octavius, afterwards the emperor Augustus, with whom his whole destiny was so intimately united. When the assassination of Julius Cæsar led to a renewal of civil distractions, it was extraordinary to see the young Octavius, only in his twentieth year, boldly stepping forward into public life, and proving himself superior at once to the ablest generals and the most subtle statesmen of Rome. Not less extraordinary was it that he should find in a youth of his own age one so able to second him both by his counsel and his energies. Agrippa is already named in history as the companion of Octavius, while yet at Apollonia. The death of Cæsar brought them both to Rome, and Agrippa appears for the first time in public life as the promoter of an accusation against Cassius, one of the assassins. Again, in 40 and 41, when he was still only twenty-two years of age, we find him playing a highly important part in the war against Lucius Antonius; and indeed the capture of Perusia, which brought that war to a conclusion, was in a great measure due to the exertions of Agrippa, who covered the siege, on the eastern side, against the united forces of Ventidius, Pollio, and Plancus. In his consulship, 37 B. C. (or perhaps the year before his consulship,) he added to his reputation by a considerable victory over the Aquitani, and rivalled the glory of Julius Cæsar by leading a second Roman army across the Rhine. A large portion of this year was employed on the part of Augustus in preparing a fleet to oppose Sextus Pompeius, whose decided superiority at sea enabled him to blockade the whole coast of Italy, so that it was difficult for Augustus to provide a fleet, much more to train a body of sailors to the manœuvres of naval warfare. The fertile genius of Agrippa was able to meet the difficulty. By cutting a passage through the celebrated barrier of Hercules, which separated the Lucrine Lake from the sea, he converted that lake and the interior lake of the Avernus into a serviceable harbour, giving it the name of Portus Julius. In the following year he commanded the fleet of Augustus, in the victory off Mylæ; and afterwards in that more decisive contest which annihilated the power of Sextus Pompey, and gave to Augustus the full possession of Sicily. In the year 33, though already of consular rank, he held the office of ædile, his administration of which was distinguished by the restoration of the numerous aqueducts, and the erection of fountains throughout the city. In the naval victory off Actium, (B. C. 31,) which left Augustus without a rival in the empire, Agrippa was again the admiral of the successful fleet. In reward for these services he shared with Mæcenas the full confidence of Augustus, who associated him with himself in the important task of reviewing the senate; and in B. C. 28 again raised him to the consulate, giving him, at the same time, in marriage his own niece, the sister of the young Marcellus. Agrippa had indeed been previously married to the daughter of Cicero's friend, Atticus, by whom he had a daughter, Vipsania, afterwards the wife of Tiberius. Attica may have been dead, or it is not improbable that he divorced her to make room for Marcella. A third consulate awaited him the year following, in which he dedicated to Jupiter, in commemoration of the victory near Actium, the celebrated Pantheon, which remains to the present day, perhaps the most beautiful specimen of Roman architecture. It is now called, from its form, *Santa Maria della Rotonda*, but still bears the inscription, *M. Agrippa L. F. Cos. tertium fecit*. In 25 he assisted Augustus in the reduction of the Cantabri, and afterwards had the honour of representing the emperor at the marriage between the unfortunate Julia and Marcellus, who seemed thus marked out as the successor of Augustus. Yet the notion of any claim, founded upon hereditary descent, was not yet established among the Romans; and the splendid deeds of Agrippa, independently of his connexion with Marcella, gave him in some respects a superior title. A rivalry sprang up between them, which was encouraged by the ambiguous conduct of Augustus, more especially during his severe illness in 22, when, apparently on his death-bed, he publicly sent his ring to Agrippa. On the recovery of the emperor, Marcellus regained his influence, and Agrippa was sent by Augustus into honourable exile, as governor of Syria. Death in a few months removed his rival, and he was not merely recalled to Rome, but, at the request of the emperor, divorced his wife Marcella to marry the young widow Julia. In 19 he finally subdued the Cantabri, who had again been in arms for more than two years. Agrippa was now looked upon as the undoubted successor of Augustus; and in the following year was so far associated in the imperial dignity as to share the tribunician power with the emperor for five years. In 17 he proceeded a second time to the East, where his administration seems to have given general satisfaction, more especially among the Jewish nation, who benefited largely by his protection. On his return from that part of the world, his last military duty was to quell an insurrection among the Pannonians, for which his presence was sufficient. In Italy he received a renewal of the tribunician power for a second period of five years, but lived only a few months. He died in March, B. C. 12. His family, by Julia, were the two young Cæsars, Caius and Lucius, Julia, Agrippina, and Agrippa Postumus, born, as his name imports, after the death of his father; and it has been observed that every one of these came to a premature end. (Appian, Plutarch, Dion, Suetonius, &c.)

AGRIPPINA, the daughter of M. Vipsanius Agrippa and Julia, the only child of Augustus, married Germanicus, the son of Drusus, and nephew of Tiberius, to whom she bore nine children. Of these three died in their infancy, but among the remaining six were Caligula, afterwards emperor, and the second Agrippina, the mother of Nero. On the death of Augustus (A. D. 14), Germanicus and his wife were with the army on the banks of the Rhine, where they had much difficulty in restraining the mutinous soldiery from proclaiming Germanicus in opposition to his uncle. On this occasion Agrippina, by her determined bearing, shewed herself worthy of her descent from Augustus, and the following year she had again an opportunity of evincing the same spirit, in a general panic occasioned by an exaggerated report, that the army of Cæcina had been cut off by Arminius, and that a large body of the successful Germans were on the point of crossing the Rhine, and inundating the Gallic provinces. A proposition was made to destroy the Roman bridge over the river, but Agrippina, in the absence of her husband, prevented this disgraceful expedient. In the year 17, the disturbed state of the East afforded the emperor a pretext for recalling Germanicus from the scene of his successes in Germany. Agrippina accompanied her husband, and was with him in Syria when he fell a victim, at least such was his own conviction, to the arts of Piso and Plancina. Germanicus was not without suspicion that Piso and his wife had been urged on by the emperor and his mother, Livia, and under this feeling he implored his wife to restrain her proud temper, and submit to the evil times. Disregarding his prudent advice, she at once proceeded to Italy, and at Brundisium seemed to court the attention of the people as she left the vessel with the youthful Caligula and her youngest infant, bearing herself the funeral urn of Germanicus. The whole tenor of her conduct was such as to call upon her the anger of Tiberius, and when her cousin Claudia Pulchra (A. D. 26) was about to be the object of a prosecution encouraged by the emperor, she ventured to express her resentment to him in person in no measured terms. Agrippina had now remained in widowhood for seven years, when she requested the emperor to take pity on her single state and give her a husband. But Tiberius knew too well that the husband of Agrippina would be a dangerous enemy, and he parted from her without giving any answer to her pressing entreaties. The artifices of Sejanus completed the breach between them. By his agents he induced her to believe that there was an intention on the part of Tiberius to remove her by poison, and Agrippina, not accustomed to conceal her feelings, for ever offended the emperor, by plainly exhibiting to him her suspicions. She was banished to the island of Pandataria, and at last closed her life by starvation, October 18th, in the year A. D. 33. Her two eldest sons, Nero and Drusus, were also the victims of Tiberius. (Tacitus, Suetonius.)

AGRIPPINA, the daughter of Germanicus and the Agrippina of the preceding article, was born in the chief town of the Ubii, which she afterward raised to the rank of a Roman colony, calling it after herself *Colonia Agrippinensis* (now Cologne). She was but fourteen years of age when Tiberius gave her in marriage to Cn. Domitius Ænobarbus, by whom she had a son, who at first bore the name of his father, but afterwards under that of Nero became Emperor of Rome. After the death of Domitius, her disgraceful conduct was made by her brother Caligula a pretext for banishment: but on the accession of Claudius, she was recalled from exile and became the wife of Crispus Passienus. There seems to be some doubt whether Passienus was her first or second husband, though the probability is in favour of the latter supposition. By assassinating her husband Passienus she soon made herself again a widow, and now directed her efforts to gaining the affections of her uncle, the Emperor Claudius. Such a connection was held to be incestuous even among the Romans, but on the death of Messalina, the complaisant senate, influenced by the intrigues of Agrippina, affected to threaten the emperor with compulsion if he refused to take a step so essential to the welfare of the state (A. D. 50). Claudius yielded, and for the fifth time entered the state of matrimony. The control of the beautiful Agrippina over her aged husband was unbounded, and her first object was to secure to her own son those expectations to which Britannicus, the son of Claudius by the infamous Messalina, was more equitably entitled. The marriage of Domitius to Octavia, daughter of the emperor, and his adoption by the emperor himself, from which he derived the name of Nero, at once placed him above Britannicus; and in the year 54, Agrippina completed the object of her ambition by poisoning her imperial husband. Her son, now at the head of the empire, was not willing to allow his mother that share of the authority which she was desirous of assuming. Her power over him disappeared; and though for a time she partially recovered it by means of an incestuous intercourse with him, the beauty of Poppæa finally destroyed even this influence; and in the sixth year of his reign Nero determined under the encouragement of Poppæa to remove his mother from the world by her own arts. But it was not easy to poison one, who, familiar herself with poison, was ever on her guard. Nero, therefore, changed his course. After an unsuccessful attempt to effect her death near Baiæ by means of a vessel with a false bottom, which had been prepared for the purpose, she was openly dispatched by assassins (March, 60 A. D.). Her last words as she presented herself to the sword of her murderer were *Ventrem feri*, Strike the womb which gave birth to such a son. To enumerate all her debaucheries, all her murders, and other crimes, would require a much larger space than we think it necessary to assign to them. We will only add, that she wrote some commentaries of which Tacitus availed himself for his historical writings. They are also quoted by Pliny, vii. 8. (Tacitus, Suetonius, Dion.)

AGRO'STIS is a genus of grasses, consisting of a considerable number of species with loose-branched, capillary panicles of flowers, and a creeping habit. Among British grasses, it is at once known by the glumes (*a*), or outer scales of each flower, being two in number, unequal in size, of a membranous texture, and containing but a single floret; while the paleæ, or inner scales, are short, very thin, almost transparent, and two in number; the larger of them occasionally having an awn at its back.

Two species only are natives of this country,—one of which, *A. vulgaris*, is found everywhere in dry, exposed, barren situations, and is of very little value to the farmer, except for its earliness; the other, *A. alba*, is equally abundant in marshy places, where it forms a valuable pasture. Under the name of Irish florin grass, this species has been the object of much attention from experimental agriculturists, some of whom, as Dr. Richardson, have extolled its qualities very highly as a marsh-fodder; but the experience of others does not confirm their opinion; nor does it appear to thrive in England to the degree that is represented in Ireland, where its vigour is such as to have led to the belief that the Irish plant is a distinct species, called *A. stolonifera*. In England it is best known, along with *A. vulgaris*, under the name of quitch, or quicks, and is generally extirpated as a troublesome weed, in consequence of the rapidity with which, by means of its creeping, rooting, vivacious stems, it spreads and overruns pasture and garden-ground.



[Agrostis Alba.]

AGUE. In treating of the individual diseases to which the human body is subject, it would be out of place in this publication to enter into the details which are proper and indeed necessary in works purely medical. All at which we can aim is to endeavour to convey a clear and correct conception of the nature of each disease, the signs by which its approach is denoted, the symptoms which demonstrate its existence, the circumstances which predispose to it, the causes which actually excite it, the precautions by which its attack may be averted, and the remedies which experience has shown to be the most effectual in curing it.

With the exception of those who have studied medicine as a profession, even the educated class in this country are grossly ignorant of everything relating to this subject. Yet there is no reason why sound knowledge may not be acquired by every man on this subject as well as on chemistry, for instance. That any one who does not study medicine with a view of practising it as a profession, should make himself so familiar with its details, as to be able to dispense with the assistance of the physician when either himself, or any one in whom he takes an interest, is afflicted with a serious disease, is not indeed to be expected, and the attempt would be quite absurd. But the more real knowledge any person can acquire on subjects of this class, the better he will be able to guard against the ordinary causes of disease; the more surely he will know, at the very first moment of its attack, when any serious malady assails him; the better he will be able to communicate with his physician and his physician with him; and the more effectually he will be enabled to co-operate with whatever plan of treatment may be adopted for the removal of his disease.

For these reasons we conceive that there is no part of our undertaking likely to be attended with greater benefit to the public, than that of rendering intelligible, in all its practical bearings, to the unprofessional reader, the nature, the causes, and the treatment of the more important diseases which afflict, and shorten, and destroy human life.

Of these diseases, the first of which we have to treat, is that termed Ague, a disease of no slight importance, though happily the peculiar interest which once attached to it, at least in this country, from its continual recurrence and general prevalence, is now greatly diminished. Ague belongs to the class of febrile diseases, and is indeed commonly considered as a paradigm or example of fever in general. Fevers are divided into three great classes. In the first the morbid phenomena that constitute the disease continue for a certain length of time; then they wholly disappear: after having been some time absent they again recur, and this repetition and return of the phenomena alternate with one another for many times. The period that elapses between the cessation of the febrile phenomena and their recurrence is called an intermission. Such fevers, then, as are attended with a cessation or intermission of the febrile symptoms for an observable space of time, are for this reason called *intermittent fevers* or *agues*. This is the first class. In the second class the febrile symptoms do not altogether disappear, but merely diminish in violence; they do not *intermit*, they only *remit*; for this reason this second class of fevers are called *remittent fevers*. In the third class, during the whole course of the disease, there is not only no retrocession of the symptoms, but no notable diminution of their violence. Such as the phenomena are when the fever is completely formed, such they continue to be with scarcely any variation until its close. For this reason this class of fevers is denominated *continued fevers*.

The concourse and succession of phenomena which constitute a fever is called a paroxysm. An intermittent fever, or an ague, is therefore a fever consisting of a succession of paroxysms, between each of which there is an intermission more or less complete.

The phenomena which constitute a paroxysm of fever are the following: The person is affected first with a loss of mental vigour, commonly indicated by inaptitude to attend to his usual avocations, or by dullness or confusion of mind. If not simultaneously with, very shortly after this mental debility there comes on a sense of physical weakness. The patient is languid, listless, disinclined to move, while every movement is performed with difficulty, and the effort to move is exhausting. The muscles or organs of motion are not merely weak—they are, at the same time, the seat of several uneasy sensations; the muscles of the extremities, and of the back especially, are affected with the sensation of soreness, as if they had been over-exercised, and this soon increases to decided pain, which is often very severe.

The next train of symptoms are ushered in by pallidness of the face and extremities: the features shrink; the bulk of the external parts is diminished; and the skin over the whole body is in a morbid state, as if drawn tight. Some degree of coldness is now felt, which at first is so slight as scarcely to be noticed, but at length the patient is fully conscious of a sensation of cold, which he commonly feels first in his back, but which thence extends over the whole body. This sensation of coldness increases until it becomes so severe as to produce a tremor in the limbs, amounting sometimes to trembling and shaking, and almost always producing distinct shivering.

From the first approach of the mental and physical languor, the pulse becomes weaker than in health. As the sense of cold comes on the weakness of the pulse is still greater, and it is at the same time always more frequent than natural; often irregular, and sometimes intermittent. The respiration also is shorter, feebler, and more frequent than in a state of health. The appetite fails; there is sometimes even an aversion to food: frequently the loss of appetite is succeeded by a sense of nausea and sickness, which occasionally increases to vomiting, and with the matter vomited there is, for the most part, a mixture of bile. From the commencement of the paroxysm there is generally some degree of thirst, which increases in urgency as the sensation of cold advances, being always proportioned to, and probably arising from, the dryness and clamminess of the mouth and fauces. Not the secretions of the mouth alone, but all the secretions of the system are diminished. The excretions also are lessened in quantity, and especially the urine, which is scanty and nearly colourless, and the alvine evacuations are usually altogether suppressed. Even in this stage, headache may come on, but it usually does *not* appear until the following.

These symptoms having continued for some time, at length disappear, and a remarkable change takes place in the character of those that succeed. The sensation of cold gives place to that of heat, and a temperature far greater than that of health prevails over the whole body. The face which had been pallid now becomes flushed and red. The eyes which had been dull and heavy, are now more bright and glistening than natural. The features of the face and the other parts of the body recover their usual size and become even more turgid. The pulse becomes more regular strong, and full, the respiration fuller and more free, and the nausea and vomiting are less urgent: if before there were pain in the head, it now increases in severity; if there were none, it is now sure to come on, and while the sensibility is increased, the intellectual operations are more and more disordered.

By degrees these symptoms also pass away, and are succeeded by a different train. A moisture now breaks out first on the forehead, which by degrees extends over the whole body. As the perspiration flows, the heat abates; the pulse becomes slower and softer; the respiration more free; the nausea and vomiting cease; the thirst diminishes; the secretions and excretions are restored; most of the functions return to their ordinary state, and the patient is left comparatively free from disease, feeling only weak and exhausted.

Such are the phenomena that constitute a febrile paroxysm, and such is the order of their succession, and they obviously constitute three distinct states, or, as they are called, stages or fits; viz., the cold, the hot, and the sweating stage.

After one such paroxysm has remained for a certain length of time it ceases; after it has ceased for a certain length of time, the same series of phenomena again arises, and observes the same course as before, and this alternation is repeated many times. It has been already stated, that the length of time from the end of one paroxysm to the beginning of another is called an INTERMISSION, while the length of time from the beginning of one paroxysm to the beginning of the next is termed an INTERVAL.

Different names are given to the different varieties of this fever according to the length of the *interval*. If one paroxysm be succeeded by another within the space of twenty-four hours, the ague is termed a quotidian; if after forty-eight hours, a tertian; if after seventy-two hours, a quartan; if after ninety-six hours, a quintan. Those with longer intervals are usually termed erratic. The most common form is a tertian; the next most common a quartan; the next a quotidian; the least frequent a quintan. Agues are likewise divided into vernal and autumnal, the vernal beginning in February, and the autumnal in August. There is a great difference in their character. The vernal in general are milder and easily cured, while the autumnal are often severe and obstinate.

It sometimes happens that two intermittents attack the same person at the same time, and the ague is then said to be complicated. The most common complication is the case in which two tertians or two quartans attack simultaneously. What is called the double tertian, for example, consists of two tertians, each of which attacks at its regular time, and consequently the paroxysm occurs every day. This form of ague is distinguished from the quotidian, by comparing the paroxysms with each other. Though a paroxysm occur every day, yet if they be carefully observed it will be found that the alternate paroxysms only resemble each other, while if the paroxysm of a preceding day be compared with that of a succeeding day, some manifest difference will be observable. There may also be another form of the double tertian; namely, with two paroxysms on one day, and another on the following day: or there may be a triple tertian, with two paroxysms on each alternate day, and one only in the intervals. The double quartan also varies. It may occur with two paroxysms on the first day, none on the second or third, two again on the fourth day, or with a paroxysm on the first day, another on the second, but none on the third.

But whatever be the form of fever, the nature of it is essentially the same: yet the form is of some consequence, as denoting the severity and tendency of the disease; for a quartan is far more obstinate than a tertian, while a quotidian is apt to change into a continued fever. Quartans, for the most part, appear in autumn, while tertians are the most common in spring.

Whatever be the form of fever the duration of the pa roxysm is different in almost every different case. The longer the paroxysm the shorter the intermission; the shorter the intermission the longer the paroxysm. An extension of the period of the intermission, or a postponement of the period of attack, is in general a favourable event, denoting that the disease is declining; on the contrary, a prolongation of the paroxysm, or an anticipation of the period of attack, marks an increase in the severity of the disease, and is a sign that the intermittent is about to lapse into a remittent or into a continued fever.

From the preceding history of the disease it is clear, that the distinguishing character of intermittent fever is the regular return of the paroxysm at a fixed period, the entire cessation of it after a certain time, and the renewal of it after a specific interval, according to the species of the ague. Nevertheless, though these distinct intermissions and accessions are always apparent when the ague is regular, yet in the most severe and formidable cases it entirely loses its intermittent character and assumes a remittent, or even a continued form.

Innumerable cases, which are commonly considered and treated as continued fevers, are really of the nature of intermittents, and of this the older physicians, who had so many more opportunities of witnessing this malady in its more formidable aspect than the physicians of the present day, were fully aware. ‘Intermittents,’ says Sydenham, ‘take their names from the intervals between the fits. This is sufficient to distinguish them, if the seasons of the year wherein they happen, namely spring or fall, be considered; but some of these have no very visible character whereby they may be distinguished from continued fevers, though they really participate of the nature of intermittents. In general the character of spring intermitting fevers is sufficiently obvious; but when autumnal intermittents come early, namely, in July, and are common, these do not immediately assume their own proper shapes, for they imitate continued fevers so well, it is hard to distinguish them. But the violence of the constitution of the season being a little quelled, about the end of autumn, they put off their disguise, and then openly appear to be intermittents, either tertians or quartans, as indeed they really were at first. And if this be not carefully observed we shall be deceived in our prescriptions, while we mistake fevers of this kind which are to be accounted intermittents, for real continued fevers.’

The apparent change of character or type here stated, dependent on the severity of the disease, is constantly observed. If a fever, truly of an intermittent nature, be of a bad kind, it often commences with the form of an alarming and dangerous continued fever, but as the disease declines and becomes milder, the intermission becomes apparent, and the true nature of the malady manifest, while, if an intermittent commences under its own form, but in its progress becomes severe, it often changes into a disease which cannot be distinguished from a continued fever.

There is nothing in the nature of disease more curious and inexplicable than this property of periodicity. During the intermission what becomes of the malady? Why after a specific interval does it uniformly recur? Physicians have endeavoured to refer this singular phenomenon, which, if it were not so clearly seen would not be credible, to the principle of habit. Dr. Cullen endeavoured to show that there is in the human constitution a diurnal exacerbation, occurring towards evening, very analogous to the febrile state, and that the recurrence of the febrile paroxysm is referrible to this diurnal habit. But were this diurnal exacerbation fully established as a fact, which is not the case, it would not account for the regular return of the paroxysm of an intermittent fever, which, as we have seen, is commonly of the tertian type, and which, therefore, returns not every day, but every alternate day, and not in the evening but at noon. The regular return of the appetite for food at a given hour; the regular return of the desire for sleep; the regular return of the alvine evacuation, which it is so important to the health to cherish; even the facility with which articulate speech is pronounced, and the formation of the gait or air of a person by which each individual is distinguished from every other, these among innumerable others are examples of that law of the animal economy by which, when any motions, whether voluntary or involuntary, are performed two or three times in succession, the same motions are easily excited again. But to no such law can the phenomenon in general be referred, for the difficulty is not to account for the renewal of motions once excited, on the reapplication of the cause that produces them, but to explain why a cause which is always present, that of the malady, acts vehemently for a given time, ceases to act at all for a given interval, and then regularly commences at the termination of that interval. We have not advanced a single step towards the elucidation of this matter beyond the point at which Sydenham left it 200 years ago.

Of the Exciting Cause of Ague.—That the effluvia which arise from stagnant water or marshy ground are the immediate or the exciting cause of this disease is now universally admitted. What the nature of these effluvia is, is not known. Neither their physical nor their chemical properties have been ascertained. Even their presence is known only by their effects on the human constitution. No other test of their existence has as yet been ascertained. The most distinguished chemists have applied all the resources of their art to the investigation of this subject, but hitherto with so little success, that all which they have ascertained is the mere fact, that in certain situations an aëriform substance is generated capable of producing intermittent, remittent, and continued fever, together with several other painful and dangerous diseases. Some conjecture that this poisonous gas is carbonic acid; others that it is azote; others again that it is hydro-carburetted gas, or hydro-sulphuretted gas, or an undiscovered compound of azote and oxygen called septon. But chemistry has yet to discover even whether this poison be a simple substance or a compound body, as well as by what test, other than its action on the human body, its presence may be determined.

Though this poison be generated in the greatest abundance and intensity in marshy and swampy ground, yet without doubt it is also produced in situations which have none of the characters of a marsh. Wherever the ground is moist and contains decaying vegetable matter, this poison is capable of being generated. Woods afford it in almost as large a quantity as marshes, because in woods the ground remains a long time damp, and always abounds with decaying vegetable matter. Hence in all the densely wooded parts of England both intermittent and remittent fevers are rife. This is especially the case in the woody districts of Kent, Sussex, Hampshire, Wales, &c. The jungle of India consists of a low and dense brushwood, or a thicket of reeds and grass; and intense heat acting on the wet and decaying vegetation, with which it abounds, the poison is here produced in the highest degree of concentration. Rice grounds, for the same reason, are notoriously productive of it. But it is curious that the clearing of woods sometimes increases the evil. Dr. Rush states that, in Pennsylvania, epidemics invariably follow the clearing and cultivation of forest lands, and that they do not disappear until after many years of continued cultivation. The same remark has been made in France; and the district of Bresse, (Lyonnais,) which was comparatively healthy when full of woods, has become nearly depopulated since they were cut down. The shade of the trees kept the sun in a good measure from the wet ground; but the removal of the trees exposes the wet ground to the full action of the sun. Meadow land, imperfectly drained, contains in abundance the two conditions, moisture and decaying vegetable matter, and is in England a frequent and extended source of this poison. It is commonly considered that a large space of land in the condition of a marsh, a swamp, a thick and damp wood, or an undrained meadow is necessary to the production of the poison; but while it is not easy to fix the minimum of the space that is requisite, it is quite certain that an exceedingly small space is sufficient. These facts show, in a striking manner, the danger and folly of creating artificial marshes as ornaments in parks and gardens. ‘Hereafter,’ says Dr. Macculloch, ‘perhaps an English gentleman will be as much surprised that his neighbour should dig a sleeping canal before his door, as that his feudal ancestor should have built his castle in a marsh, and inclosed it with a putrid moat. The pond which has been constructed for a few gold fishes, or the river which meanders through the woody valley, is often the death spring of diseases; and the produce of a few bunches of rushes, or even a splendid display of water-lilies, are dearly purchased at the cost of the fevers and the toothaches which are the torments of the owner's family, the ailing wife who is his own torment, and the sciatica which is the torment of his poorer neighbours.’

Wherever generated, this poison, either mechanically mixed or chemically combined in the air, is capable of being conveyed in unimpaired power to a considerable distance by currents of wind. The influence of the Pontine marshes, situated at the distance of fourteen miles from Rome, is often felt in that city.

In warm climates, where this poison is generated in the highest degree of intensity, it sometimes proves suddenly fatal to individuals of a ship's crew when the vessel is several miles from land. It is brought with the land-wind. It seems certain that the poison can be carried as far as the smell of the land is perceptible. A memorable instance of this occurred in a vessel that was five miles from shore. The wind suddenly shifted; the smell of land was perceptible; the nature of the neighbouring coast was known to the people on board, and the danger duly appreciated; every one that could do so hastened below to save himself from the noxious breeze. Some of the crew, however, were unavoidably employed on deck; the armourer of the ship was detained a few minutes in order to clear an obstruction in the chain cable, and was seized with fatal cholera in the very act in which he was engaged. Of the men that remained on deck, several died of the same disease in a few hours, —the attack having been simultaneous with the very first perception of the land smell; and in our own country it is often conveyed by currents of wind to a distance of several miles. It frequently proceeds to the hills of Kent, for example, several miles distant from the marshes of Erith, Northfleet, or Gravesend. The watery vapour that is so apt to arise in situations most favourable to the generation of this poison appears to be an exceedingly formidable conductor of it. Sir John Pringle, who had many opportunities of observing this fact in the campaigns in Flanders, about the middle of the last century, uniformly found that the number of men who were seized with sickness during the prevalence of a fog, far exceeded the number attacked when the weather was clear, though he did not attribute to the fog the production of the poison, but justly considered it as merely the conductor of it.

But to whatever distance a current of wind or a dense fog may be capable of conveying this poison in sufficient quantity and concentration to produce disease, yet there cannot be a question that the poison is most intense the nearer to the marsh and the closer to the ground. Persons who live within a certain distance of an unhealthy spot often suffer severely, while those who reside at a somewhat greater distance escape. Persons who live in the basement story of a damp and undrained house, and especially those who sleep there, are constantly attacked with fever, while those who live in the upper apartments of the same house remain free from disease.

There are spots in which this poison is generated in such quantity and intensity as to be capable of killing instantaneously whoever is exposed to it. Exposure to it in certain situations has proved fatal with a rapidity and certainty equalled only by a mortal dose of Prussic acid. Exposure to it in other situations produces what may appear to be, and what is sometimes mistaken for, apoplexy—an affection of the brain causing death more rapidly than almost any other disease to which the human body is subject. Exposure to it when less concentrated produces malignant fever of a continued form, destroying life in a few days or hours. Exposure to a still smaller concentration produces remittent, and to a yet smaller, the milder form of intermittent fever. And it may be so minute in quantity or so destitute of virulence in its own nature, as to be incapable of producing even intermittent fever, in its regular and well-marked form, and yet sufficiently potent to produce a long catalogue of grievous maladies. The secondary diseases which have this origin, and which have been much overlooked, consist for the most part of those painful affections of the nerves, which have been lately classed together under the general term of *neuralgia.* The exquisitely painful, and too often unmanageable diseases called tic douloureux, the disease called sciatica, the toothache, and more especially periodical headache, are oftentimes clearly traceable to this poison, and are as certainly produced by it as the most distinct and regular ague. Persons who live in situations where this poison is generated in abundance may never have ague, but at the same time they never enjoy a moment's health; while it is certain that long-continued exposure to it, though it may not produce any specific disease, included in the catalogue of the nosologist, fearfully abridges the term of life. Few persons in such situations attain the age of fifty. In some parts of America, few of the inhabitants formerly lived beyond the age of forty; those who survived thus long had, at that early period, all the characters of extreme old age; already in those very situations, by the clearing, draining, and general cultivation of the land, the average term of life has been extended fifteen or even twenty years. There can be no question that the value of life which, in modern times, has increased so much in our own country, and which has improved in the rural districts in proportion to the better cultivation and the more complete draining of the land; and in the larger towns and cities to the better ventilation and the greater cleanliness for which they have been remarkable, has been mainly owing to these causes. So recently as the beginning of the present century, a celebrated physician, who had large experience of this matter, states, as a fact that came within his own observation and experience, that in small villages, in which the annual number of persons attacked with ague amounted to 200, not one case had occurred for several years.

Dr. Macculloch gives a vivid and but too faithful picture of the external appearance and of the constitutional disorder of the people who constantly reside in the midst of this poison, and who are not suddenly cut off by it under some acute form of disease.

Of the remote or predisposing Cause. It has been stated* that the remote, or the predisposing cause of disease is that which brings the system into a condition capable of being affected by the immediate or exciting cause. Whatever diminishes the vigorous action of the organs, impairs their functions, and so weakens the general strength of the system, is capable of becoming a predisposing cause of fever; and every predisposing cause acts in one or other of these modes, and becomes a predisposing cause only and in proportion as it lessens the energy of the system, or disturbs the balance of its actions, which in fact is to render some portion of it weak. During a state of vigorous health the body is endowed with the power of resisting the influence of noxious agents, which in a less perfect state of health are capable of producing intense and fatal disease; and the action of all predisposing causes is to lessen this resisting power, or to weaken the energies of life.

Of all the predisposing causes of ague the most powerful is the continued presence, and the slow operation of the immediate or the exciting cause. The manner in which the immediate or the exciting cause of fever operates as a predisposing cause has been amply illustrated by Dr. Southwood Smith. 'It is a matter of constant observation,' says this author, 'that the febrile poison may be present in sufficient intensity to affect the health, without being sufficiently potent to produce fever. In this case the energy of the action of the organs is diminished, their functions are languidly performed, the entire system is weakened, and this increases until at length the power of resistance is less than the power of the poison. Whenever this happens, fever is induced; not that the power of the poison may be at all increased, but the condition of the system is changed, in consequence of which it is capable of offering less resistance to the noxious agent that assails it.

'We have seen that the vegetable or animal poison may exist in sufficient intensity to produce fever on the slightest exposure to it, without the operation of any predisposing cause, in a body in the state of the soundest health, and endowed with the greatest degree of strength. Examples of this kind are but too frequent in tropical climates. In countries where the temperature never rises so high, and seldom continues so long, it is rare that fever is produced immediately on exposure to the exciting cause. Concentrated and potent as that poison is in many parts of Flanders, yet Sir John Pringle states that, "on removing to an unhealthy situation, the men rarely became ill at once; that they generally continued in tolerable health for some days; and that recruits recently arrived in the country resisted the noxious agent longer than the men who had been long there." Dr. Potter gives a remarkable example of the same fact, with regard to the yellow fever, which fell under his own observation, and states other facts strikingly illustrative of the influence and operation of the predisposing causes. Strangers, from certain countries, he informs us, are insusceptible of yellow fever in America. In the most malignant and protracted epidemics which afflict that country, these strangers uniformly escape; emigrants from the West Indies, and other warm latitudes, for example, invariably resist the cause which produces these maladies in the native inhabitants. But the curious fact is, that such persons are unable permanently to resist the operation of the exciting cause; for, after a residence in America of some years, their constitution is so completely assimilated by the influence of the climate to that of the American, that they become equally sensible to its febrile miasma, and are as exquisitely impressed by them as the American citizens themselves. The illustration is equally striking and instructive if the position be reversed. The natives of northern climates are extremely susceptible to the influence of these miasma; that susceptibility is in exact proportion to the latitude of their country: those from the north of Europe scarcely ever escape an attack; the natives of Great Britain are nearly as susceptible to the influence of the poison, while persons even from the more northern countries of the United States are more liable to the disease than the citizens of the southern and middle states.’

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* See Treatise on Fever by Dr. Southwood Smith.

Among the other predisposing causes may be reckoned the period of life. All persons between the age of puberty and that of thirty-eight are peculiarly predisposed to this disease. After the disease has once existed, there remains in the constitution a remarkable susceptibility to its recurrence; and that from very slight causes, as from the prevalence of an easterly wind, or exposure to a very minute quantity of the poison that originally produced it, such as would not affect a person who had never been the subject of the disease. Hence, persons who have been once or twice, or oftener affected with ague, are most delicate tests of the presence of the exciting poison. Deficient and poor diet; intemperance; physical and mental fatigue; anxiety, cold, damp, debility, however induced—all these are extremely powerful predisposing causes. They enable a less dose of the poison to produce the fever, and they increase the intensity of it when established. They all act by weakening the resisting power inherent in the constitution, that is, by enfeebling the powers of life. In a vigorous state of the health, exposure to the poison, even in a concentrated state, may occasion no mischief, because the resisting power of the constitution may be greater than the power of the poison, but no human strength can resist a continued exposure to it; for, as has been already stated, if such long-continued exposure do not produce disease in the form of ague, it will certainly produce it in some other shape; which, if it do not immediately kill, will assuredly shorten life.

Of the Cure.—The first object in the treatment of a person affected with ague is to remove him from the influence of the poison by taking him out of an unhealthy, and placing him in a healthy situation. Unless this can be done, every remedy employed must act at a great disadvantage, and the power of the poison, or the debility of the patient, may be such as to render every effort to cure the disease unavailing without a change of residence. Often, however, circumstances will not admit of the removal of the patient. Whenever this is the case, the sick person must at least be put and kept in an apartment the most remote from the noxious spot, and it is a good and important general rule to place him in the highest part of the house. When this precaution is neglected, remedies constantly fail which readily and completely succeed when it is observed.

A vast variety of medicines have been recommended as sovereign remedies in this disease, and such an enumeration may be useful to the experienced and judicious practitioner, because he knows how to select, and he may find in the catalogue what may suggest the precise modification adapted to any individual case of peculiarity and difficulty which he may chance to have in hand. But the student and the young practitioner require more precise direction, and the mode of procedure which proves the most effectual in the great majority of cases cannot be too clearly and definitely pointed out.

Passing by the treatment adapted to the severest cases that occur in hot climates, in which, indeed, human art is too often of no avail whatever, we are fortunate in possessing three remedies, the proper employment of which seldom fails to cure the most formidable and inveterate intermittent which ever occurs in this country, namely, ipecacuanha, bark, and arsenic.

The treatment of ague includes the management during the paroxysm, the intermission and the convalescence. None of these remedies is suitable to all these periods, and what will effectually cure in one, may prove positively *injurious in another.*

First of the treatment during the paroxysm. The approach of the paroxysm should be carefully watched. The moment the first indication of its accession is apparent, whether that indication be afforded by a return of languor, or listlessness, or pain of the head, or a sense of confusion, or, above all, of coldness or chilliness, an emetic, consisting of twenty grains of the powder of ipecacuanha with one grain of the tartar emetic, should be given. The operation of the emetic may be promoted by drinking freely warm water, or warm chamomile tea *after* (*but not previously*) the first act of vomiting has occurred. As soon as the operation of the emetic is over, a draught should be taken, consisting of forty drops of laudanum in an ounce and a half of camphor julep. This plan, in almost all cases, will completely stop the coming on of the cold fit; in a great number of cases it will also prevent altogether the accession of the hot fit, inducing at once the sweating stage, that is, the stage which constitutes the solution of the paroxysm. But if it should not actually stop the accession of the hot stage, it will assuredly diminish its violence and shorten its duration; and as soon as the hot stage is formed, the laudanum should be repeated in smaller doses, namely, in doses of from ten to twelve drops, repeated every hour, and continued until the sweating stage is completely established.

As soon as the cessation of the sweating stage terminates the paroxysm, and the latter is succeeded by the stage of intermission, the bark should be freely taken. Of all the preparations of bark, the sulphate of quinine is incomparably the best. The dose is from two to four grains, and the most convenient mode of administering it is in the form of pill. During the whole period of the intermission, the dose of quinine should be repeated every hour, or every two hours, according to the urgency of the case. If the biliary secretion be unhealthy, which it almost always is, it will be useful to combine with every alternate dose of the quinine, from the sixth to the fourth part of a grain of blue pill, together with two grains of the extract of gentian. If the bowels be constipated, the addition to each pill of from one to two grains of the extract of rhubarb will form an excellent aperient. Given in this mode, the extract of rhubarb moderately, but in general effectually, stimulates the alimentary canal, gently increasing its action, without producing purging. If, however, the bowels be constitutionally torpid, or be rendered so by the disease, a more active aperient must be substituted, and such will be found in the compound decoction of aloes, or the infusion of senna with camomile. The condition of the bowels must never be neglected, for a state of constipation will powerfully counteract every remedy.

This plan should be continued without intermission until the recurrence of the symptoms which denote a fresh accession of the paroxysm. Then the quinine, &c. should be suspended, and the emetic should be again repeated, which, as soon as its action has ceased, should be followed by the opiate, and this, on the solution of the paroxysm, by the bark, and so on in a constant series, until the paroxysm return no more. By this method of treatment the disease is usually cured after the third accession, consequently it is seldom necessary to repeat the emetic more than three times, and often twice and even once is sufficient. Formerly there was a great difficulty in exhibiting the bark. From one to two drachms of the powder was prescribed every hour, and nothing was thought to be accomplished unless from one to two ounces were accumulated in the stomach before the expected return of the paroxysm. There were few stomachs which could bear this quantity, and accordingly all sorts of combinations with aromatics and spirits were tried, but commonly tried in vain, to enable the stomach to retain it. The system, besides being oppressed by the disease, was thus still further harassed by the disorder of the stomach and bowels occasioned by the remedy. The preparation of quinine has obviated all these difficulties, and the science of medicine owes a large debt of gratitude to chemistry, for the wonderful simplification and concentration of the most potent remedies which it has effected. One grain of quinine will accomplish more than a dram of the bark. The necessity of taking fifty-nine drams of useless matter which oppressed and irritated the stomach, already in a weak and irritable state, is obviated, and consequently the cure is much more easily and rapidly effected.

Bark, however powerful and effectual during the intermission, is commonly conceived to be useless and even pernicious during the paroxysm. But this is the period when opium is most effectual. It has now been tried on a very large scale, and the favourable report of it by those who first tried it has been fully confirmed by subsequent experience. Extended opportunities for observing ague do not occur in London, and when they do occur, the cases are never, perhaps, the most formidable. Cases, however, are continually occurring, and we have witnessed more than enough to satisfy us of the speedy and most beneficial effects of opium, especially when the exhibition of it has been preceded by an emetic. It has, however, been given with success as the sole remedy. Dr. Trotter, who had an opportunity of observing its effects on a large scale in the Channel fleet, under Earl Howe, states, that whenever the sick felt the first approach of an attack, he prescribed from thirty to forty drops of laudanum; that if this dose did not bring on some warmth in the course of ten or fifteen minutes, he gave from twelve to fifteen drops more; that it was seldom necessary to increase the quantity beyond sixty drops in the space of an hour, decided relief being always afforded in that time; that in a few minutes from the exhibition of the opiate the spirits became exhilarated; the constriction on the skin was removed, and was followed by relaxation; the countenance looked more animated; a flush spread itself over the cheek; the pulse, from having been weak, quick, irregular, and sometimes intermittent, became less frequent, and more full and more equal; an agreeable warmth was diffused over the whole frame, and every unpleasant feeling vanished sometimes in a quarter of an hour. As soon as any symptoms indicated a return of the paroxysm, the laudanum was repeated in the same manner as at the accession of a former fit, and always with equal success, so that the patient seldom experienced much trembling and shaking; it was observed that the second paroxysm was commonly an hour or two later in the day than the preceding, and but few instances occurred of a return of the disease after the third paroxysm. The patients themselves were so satisfied of the efficacy of this remedy, that the moment they felt the first approach of an attack, they were sure to run to the cockpit for relief.

Dr. Lind, who also tried this remedy on a large scale, states, that, according to his experience, the good effects of opium are more uniform and powerful in intermittent fever than in any other disease, and that it affects the disease more rapidly than any other medicine; that if taken during the intermissions, it has no effect either in preventing or mitigating the succeeding paroxysm; that when given in the cold fit, it occasionally removed it; but that when administered half an hour after the commencement of a hot fit, it almost always afforded immediate relief. 1. It abated the violence of the fit and shortened its duration. 2. It relieved the head, put an end to the burning heat, and brought on a profuse sweat, which was more copious than when not occasioned by opium, and attended with a softness of the skin instead of the intense burning sensation common in the sweating stage. 3. It constantly produced a tranquil and refreshing sleep, from which the patient awoke bathed in sweat, and in a great measure free from all complaint. From the speedy and complete solution of the attack, it is contended that this remedy not only shortens the duration of the disease more than other medicine, but more effectually preserves the constitution from injury, insomuch that, after its use, it is seldom that dropsy, jaundice, or ague, disease of the liver, spleen, or any other viscus, is witnessed. According to this physician, opium is the best preparative for the bark; since it not only produces a complete intermission, in which case alone the bark is effectual or even safe, but it occasions such a copious and salutary evacuation by sweat, as generally to render a much less quantity of bark requisite.

The names just cited are both good and independent authorities, their statements are the result of observation and experience, and they show in a striking manner the efficacy of the practice we have recommended, which is also derived from ample experience.

When the intermittent is of long continuance, or when the patient is advanced in years and weak, or when the season is rainy, or the situation damp, it will be advisable to add serpentaria to the quinine, and to combine some aromatic with both. Thus the quinine may be given in two ounces of the infusion of serpentaria, with a dram of the compound tincture of cardamom, and a scruple of the aromatic confection.

It is not sufficient that the recurrence of the paroxysm has been stopped once or twice by the use of the remedies prescribed. It should be borne in mind that there is in this disease a great tendency to relapse, and this tendency continues through the whole period of convalescence, and for some time after. The quinine should be continued in smaller doses for some weeks after the last paroxysm has supervened, especially if the weather be damp or easterly winds prevail.

If aperients are necessary, they should be warm and aromatic, and given during the intermission, so that their operation may be over before the accession of the paroxysm.

When an ague is severe, obstinate, neglected, ill treated, or attacks a person whose constitution was previously unsound, organic disease is occasionally produced, which always renders the treatment difficult and the cure uncertain. The organs that are most liable to be diseased are the liver and the spleen; these become enlarged and hardened, schirrous, as it is technically termed. The tumors occasionally press upon the great veins of the liver, and prevent the blood from passing freely from the abdominal viscera; the passage of the blood being retarded, the serum or the fluid part of the blood is exhaled into the cavity of the abdomen in greater quantity than the absorbents can take up, consequently it accumulates and thus forms dropsy.

These tumors may also press upon the ducts that carry the blood from the liver into the duodenum, or the small intestines which receive it; it may, therefore, be taken up by the absorbents and carried into the blood, diffused over the system and so produce jaundice.

In the same way diarrhœa may be produced. The blood, not passing freely through the abdominal viscera, may be determined in larger quantity than usual upon the intestines; the capillaries of the mucous membrane of the intestines thus loaded with blood secrete actively, and pour a larger quantity of fluid than natural into the canal, which is excreted in the form of diarrhœa. This diarrhœa is always colliquative, that is, weakening and exhausting to the system, without diminishing, but rather increasing the disease. Astringents must be given cautiously. Mild aromatic aperients combined or alternated with opiates are the most effectual remedies. But the diarrhœa may be the consequence of inflammation of the mucous membrane; then bleeding or leeches may be necessary, and the oleaginous aperients are the only safe ones, as the oil of almonds, or castor oil with mucilage of gum arabic, combined with a few drops of laudanum, or a few grains of Dover's powder. During the paroxysm, the only food of the patient should be arrow-root, sago, panada, barley-water, and the like. During the intermission, animal food may be allowed and a moderate use of wine.

Change of situation is a most powerful remedy; 1st, because it may remove the patient out of the sphere of the poison that produces the malady; 2ndly, because this is one of the diseases in which mere change of air is beneficial.

This disease is peculiarly apt to return. Relapse is brought on by very slight causes; a very small dose of the poison will renew it.

It is probable that errors in diet, or constipation will also do it. It is certain that cold, and that the east wind will do so; but it is probable that in the cold and moist air, and in the east wind, there is diffused some of the malaria. The patient should not go out in damp or cold weather, or during the east wind.

In protracted and obstinate cases which do not yield readily to quinine, arsenic, without doubt, is a very powerful remedy, and its efficiency is increased by its combination with opium or quinine. The proper dose of the arsenic is from two to three or ten drops of the liquor arsenicalis three times a day. This remedy should always be given soon after a meal; for if taken when the stomach is empty, it is apt to produce pain and vomiting. The operation of the remedy should also be carefully watched day by day; for, like other mineral poisons, it is apt to lie latent in the system for a considerable time, producing no apparent effect, and then suddenly to produce violent symptoms. Even the physician is not warranted to have recourse to a remedy of this kind, when a milder medicine will accomplish the cure with equal efficiency and rapidity; but when the disease does not yield to ordinary remedies, the cautious and judicious employment of arsenic will seldom fail to remove it. In no case, however, should this most active poison be administered without constant watching on the part of the medical attendant, and, of course, the employment of it without medical superintendence is altogether out of the question.

AGUESSEAU (HENRI FRANCOIS D'), a chancellor of France. He was born November 27, 1668, at Limoges, the principal town of the then province of Limousin, and now the chief town of the department of Haute-Vienne. His father, who was *intendant* of that province, devoted himself to the education of his son. The sober judgment and the cultivated taste, which Henry displayed through life, reflect the highest honour upon his paternal teacher.

The abilities of Aguesseau brought him early into notice. At the age of 21, he was admitted an advocate at the Châtelet; and, three months after, he was made one of the three advocates general. It has been said, that this high office was conferred upon him through the recommendation of his father, in whom Louis XIV., the then reigning monarch, placed great confidence. During ten years that he filled the situation, he obtained that great reputation which secured his future elevation.

In the year 1700, he was appointed Procureur Général (Solicitor General). His opposition to the registration in parliament of the papal bull UNIGENITUS, which he considered as an assumption of the papacy inconsistent with the rights of the French nation, and destructive of the independence of the Gallican church, had nearly caused his disgrace with the king. But he maintained his position by the force of his talents and integrity. He employed his authority as Procureur Général in most cases wisely and honestly. He reformed the system of the management of public hospitals; improved the discipline of courts of justice; and instituted a quicker mode in the investigation of criminal cases previous to their being brought to judgment.

Aguesseau aspired through life to the high but difficult reputation of a legal reformer;—and it is in this particular that his character has the greatest claim upon our respect. His principal objects were to define the limits of particular jurisdictions; to introduce uniformity in the administration of justice through the various provinces; and to secure the right to the subject of a just testamentary disposition of his property. His praiseworthy attempts were resisted no doubt by all those whose mistaken interests suggested to them that the attainment of justice ought to be kept expensive and uncertain, instead of being rendered cheap and secure. He is said to have confessed that he did not go so far as he wished, because he did not like to reduce the profits of his professional brethren. This was a mistake even in mere worldly policy; for when law, as well as any other article of exchange, is dear and worthless, the purchasers will be few. D'Aguesseau was not much before his age, probably, in the knowledge of political economy, or he yielded to popular clamour. During the famine which afflicted France in 1709, he carried on vigorous prosecutions against what were called forestallers and monopolists, that is, holders of corn—a class of persons who, by equalizing the price of corn, by buying in times of plenty, and selling at a profit in times of scarcity, have done the only thing which could relieve the pressure of bad harvests upon the people.

In 1717, Aguesseau succeeded Voysin in the chancellorship. His appointment to this high office by the regent, (Duc d'Orléans,) in the minority of Louis XV., gave general satisfaction. However he did not retain it long, for he was dismissed and exiled the following year, on account of his opposition to Law's financial system. His perception of the fallacy of this adventurer's schemes for substituting fictitious wealth for real capital, showed that, in some points of political philosophy, his views were sound. His recall, two years afterwards, at the moment of the great crisis brought about by Law's system, was a signal triumph for Aguesseau. His high sense of integrity and justice would not allow him to hear of a national bankruptcy: he insisted on making good the government obligations, or at least allowing those who held its paper to lose only a proportionate part; and, by thus preventing a bankruptcy, he contributed in some degree to restoring general confidence.

New agitations were again raised on account of the bull *Unigenitus*, the registering of which parliament still opposed. Aguesseau, by endeavouring to conciliate both parties, exposed himself to the charge of a change of opinion in this matter. The parliament were on the eve of being exiled to Blois, when they at last consented to register the bull with modifications.

Cardinal Dubois, the unworthy favourite of the Regent, claimed precedence in the council; and Aguesseau retired from office in 1722, rather than yield to him. He lived quietly at Fresne until 1727, when he was re-appointed chancellor. During the five years of his retirement he assiduously cultivated those literary tastes which so greatly distinguished him amidst the mass of mere lawyers. From his re-appointment to office, till 1750, he continued to administer justice uninterruptedly; he was then eighty-two years of age, and feeling himself unable to discharge the high duties of his station, he sent in his resignation to the king, who accepted it, but granted him an annuity of 100,000 francs. This he did not enjoy long, as he died the following year, on the 9th of February. Aguesseau was buried by the side of his wife, in the churchyard of his parish church. He desired, after her example, that nothing should distinguish his tomb from those of his humbler fellow-parishioners; but the king and the public resolved upon doing greater justice to the memory of so great and excellent a man. A suitable monument was therefore erected in front of the church; but it was destroyed during the horrors of the French revolution: the remains of the chancellor were even disturbed, and removed to another place into which they were thrown with the bones of thousands. A statue, representing him, is now in front of the Palais Législatif, (Chamber of Deputies,) by the side of the one erected in honour of l'Hôpital. It was placed there in 1810, under the reign of Napoleon.

The principal features of Aguesseau's character, says the Duc of St. Simon, were much natural talent, application, penetration, and general knowledge; gravity, justice, piety, and purity of manners. According to Voltaire, he was the most learned magistrate that France ever possessed. Independently of his thorough acquaintance with the laws of his country, he understood Greek, Latin, Hebrew, Italian, Spanish, Portuguese, &c. His knowledge of general literature, assisted by his intimacy with Boileau and Racine, gave an elegance to his forensic speeches which was previously unknown at the French bar. His works, now extant, form 13 vols. 4to.; they consist principally of his pleadings and appeals, (*réquisitoires*,) when advocate and solicitor general, and of his speeches at the opening of the sessions of parliament.

AHANTA, the name of a small district lying along the Gold Coast, in Africa, which has been sometimes confounded with Ashantee. It is now, however, like the whole of the Gold Coast, subject to the sovereign of that kingdom. In Mr. Bowdich's map it occupies the space along the coast lying between 3° and about 2° 10′ W. longitude from Greenwich; and its breadth from north to south is very inconsiderable. On the west of it is the river which the Portuguese call Ancobra, and the natives Seenna, beyond which is the district called Amanahea; to the north is Warsaw; and to the east are the districts of Assin and Fantee, from which it is divided by the river Boosempra. Ahanta is itself divided into three districts, Amanfoo, Adoom, and Poho. Its chief town is Boossooa. At the town of Succondee, on the coast, there used to be an English settlement; but it has now, we believe, been abandoned. There are, or were, also two or three Dutch forts at other places. The principal projection of the coast is Cape Three Points. The district of Amanfoo is stated by Mr. Bowdich to abound in fine gold. Bowdich's *Mission to Ashantee*, p. 216, &c. [See ASHANTEES.]

AHASUERUS or **ACHASHVEROSH**, is the name of the Persian monarch whose feastings, revelry, and decrees are recorded in the book of Esther. The apocryphal additions to that book, as well as the Septuagint, and Josephus, call him Arthasastha or Artaxerxes; he is probably the same king as the Artaxerxes Longimanus of the Greek historians, whose reign commenced B.C. 465. His favourable disposition towards the Jews (Esr. vii.) might be owing to the influence of the Jewish woman, Esther. The name Achashverosh occurs also, Dan. ix. 1, where some interpreters take it for Astyages, king of the Medes; and Esr. iv. 6, where Cambyses seems to be meant by it. (See Eichhorn's *Repertorium für biblische und Orientalische Literatur*, vol. xv.: p. 1. seq.) The word Achashverosh has been explained by means of the modern Persian as signifying 'an excellent or noble prince' (see Winer's *Lexic. Hebr.* s. v.): this would nearly agree with the explanation given by Herodotus (vi. 98) of the name Artaxerxes, which according to him means 'a great warrior.' The signification of the name accounts for its being given to various monarchs.

AHAZ or **ACHAZ**, the son of Jotham (2 Kings, xv. 38, xvi. &c.) a king of Judah, who reigned 743-728 B.C. and was contemporary with the prophets Isaiah, Hosea, and Michah.

(See Is. i. 1.; vii. 1. Hos. i. 1. Mich. i. 1.) He made the dial mentioned Is. xxxviii. 8. Another Achaz is mentioned, 1 Chron. viii. 35.; ix. 42.

AHAZIAH, also written **ACHAZIAH** or **AHAZIAHU**, the son of Ahab, a king of Israel, who reigned 897-896 B.C. (1 Kings, xxii. 40. 2 Chron. xx. 35.) Another Ahaziah, the son of Jehoram, was king of Judah 884-883 B.C. (2 Kings, viii. 24.; ix. 16.) who occurs also under the name of Jehoahaz (2 Chron. xxi. 17.) and Azariahu (xxii. 6.) The name, according to its Hebrew etymology, is interpreted as signifying 'the property or possession of the Lord.'

AHMED I., the fourteenth sultan of the Ottoman empire, was the son of Sultan Mohammed III. He came to the throne in the year 1603, and, contrary to the practice of many of his predecessors, spared the life of his brother Mustafa. He was unfortunate in a war with Shah Abbas of Persia, during which he lost the important town of Erivan. (See ABBAS.) He at the same time supported an insurrection in Hungary and Transylvania against the German Emperor, Rudolph II.: in 1606, however, a treaty of peace was concluded at Komorn and Situarok between the two monarchs. The efforts of Ahmed's government were then directed towards the suppression of revolutionary movements in the Asiatic part of the Ottoman dominions, which had been instigated chiefly by two daring adventurers, Kalender Ogli and Janbulad-zade: both were finally subdued, and in 1609 tranquillity was restored in the interior of the empire. Ahmed I. died in 1617. He was of a mild and moderate disposition, and fond of the enjoyments of a quiet and luxurious life: it is said that his seraglio contained 3000 women, and that not less than 40,000 falconers were in his pay. A magnificent mosque, which he built at Constantinople, and a richly ornamented curtain which he sent to the sanctuary at Mecca, attest, at the same time, that he was not indifferent about the Mohammedan religion.

AHMED II., the son and successor of Sultan Soleiman III., occupied the throne of the Ottoman empire from 1691 till 1695. He owed his elevation to the throne chiefly to the influence of the celebrated grand-vizir Kiuprili or Kiuperli, who soon afterwards fell in a battle against the Austrians near Salankemen or Slankement. Ahmed II. was a weak and superstitious prince. His reign is marked by many disastrous events. The plague, a famine, and an earthquake desolated the empire, and the capital was afflicted with a destructive fire. The Bedouins of the Arabian desert, in defiance of the imperial safeguard, dared to attack the caravan of the Mecca pilgrims; and at sea the Turkish empire was infested by the Venetians, who took possession of the island of Chios, and even threatened Smyrna. Ahmed II. died, it is said, from grief, in 1695, at the age of fifty years. His successor was Mustafa II., who reigned from 1695 till 1702,

AHMED III., the son of Sultan Mohammed IV., was raised to the throne of the Ottoman empire in consequence of a revolt of the Janizaries, in 1702. When, after the loss of the battle of Pultawa (1709), King Charles XII. of Sweden took refuge at Bender in the Turkish dominions, he was well received by Ahmed, who even made him a present of ready money to the amount of 16,000 ducats. Charles XII. succeeded in kindling a war between the Ottoman Porte and Russia, which turned out favourable for the Turks. During several days Czar Peter the Great was cut off and placed in a most embarrassing situation on the banks of the river Pruth, almost within the grasp of the Turkish army; and though the unskilfulness of the Turkish commander Battaji Mohammed let him escape from this difficulty, he was yet soon afterwards obliged to resign to the Turks the important town of Azof. Ahmed III. was also fortunate in a war with the Venetians, who were compelled to quit the Morea, and to give up the islands of Cerigo and Cerigotto, and their possessions in Candia. But he failed in an attempt to take Hungary from the Austrians. Prince Eugene of Savoy won an important victory over the Turks near Belgrade, and by the subsequent peace (made at Passarowitz, in 1718) that town, as well as Orsowa, and part of Servia and Wallachia, came under the Austrian dominion. In 1723 Ahmed entered into a treaty with Russia, and soon afterwards commenced a war with Persia, which brought the frontier towns and provinces of Erdilan, Kermanshah, Hamadan, Urmia, Ardebil, and Tebriz into the possession of the Turks, and a peace subsequently concluded with the Persian king, Ashraf Khan, secured to the victors the possession of their conquests: but Nadir Shah, the successor of Ashraf Khan, disregarded these stipulations, and by degrees retook the conquered provinces. The news of the capture of Tebriz by the Persians caused a revolt at Constantinople, in consequence of which Ahmed III. abdicated the throne in favour of his nephew, Mahmud I. (1730). He died six years afterwards in prison, at the age of seventy four.

AHMEDABAD, a fortified city, situated in a district of the same name in the province of Gujerat, or Guzzerat, and presidency of Bombay. This city is of great antiquity; it was formerly the Mohammedan capital of the province, and was celebrated, as well for the number and beauty of its religious and other public buildings, as for the extent of its commerce and manufactures. This prosperity it lost under the sway of the Mahratta chieftains, who ruined its trade by imposing enormous duties upon every branch of its commerce, and oppressed the inhabitants by taxing to the utmost all articles of consumption which were brought within the city.

In the year 1818, Ahmedabad came into the permanent possession of the East India Company, immediately upon which the exorbitant rates of duty exacted by their predecessors were abolished, and a uniform tax upon its commercial products was established in their stead; at the same time all articles of consumption were declared free of duty, with the exception of tobacco and opium, as to the trade in which the company maintains a profitable monopoly.

The city, which is estimated to contain a population of 100,000 souls, is favourably situated on the banks of the Subermatty river, in 23° 1′, N. lat., and 72° 42′, E. long. It suffered considerable damage from an earthquake in 1819.

The distance of Ahmedabad from Bombay, by the usual travelling route, is 321 miles. From Poona the distance is 389, from Delhi 610, and from Calcutta 1234 miles. Rennell's *Memoir of a Map of Hindostan;* Sir John Malcolm's *Memoirs of Central India; Parl. Papers;* Hamilton's *E. I. Gazetteer.*

AHMEDNUGGUR, a strongly fortified city in the province now known as Aurungabad, in the presidency of Bombay.

This city was founded in 1493, by Ahmed Nizam Shah, who, having established the independence of the state, gave his own name to it and to the infant city, and made the place the capital of his dominions. He resided here until his death in 1508.

Following the common fate of the native states of India, Ahmednuggur was, from this time, the scene of a series of revolutions, until, in 1634, it became a part of the Mogul Empire, and so continued until after the death of Aurengzebe in 1707. It was then seized by the Mahrattas, and remained under the dominion of the Peshwa until 1797. In that year the city, together with the surrounding district, was captured by Dowlut Row Scindia, from whom it was wrested by General Wellesley in 1803, and at the conclusion of the war, shortly after, was restored to the Peshwa. Ahmednuggur has since reverted to the possession of the Company, and is now the head station of a civil, military, and judicial establishment of Europeans.

About half a mile from the city stands a fort of an oval shape, one mile in circumference, built of stone, and flanked by numerous round towers. The city is also surrounded by stone walls. It contains a handsome square or market-place, and numerous well-built streets. The palace of the former sultans is a massy pile of building, surrounded by a broad moat faced by solid masonry. The fortress is altogether one of the strongest in India.

The city is supposed to contain about 20,000 inhabitants. It is situated in 19° 5′ N. lat. 74° 53′ E. long. distant 83 miles from Poona, 181 from Bombay, 830 from Delhi, and 1119 from Calcutta. Rennell's *Memoir of a Map of Hindostan;* Sir John Malcolm's *Memoirs of Central India;* Hamilton's *E. I. Gazetteer.*

AHWAZ, or **AHWUZ**, is a town situated about 100 miles north-east of Bassorah, and 48 miles south of Shuster. The name of Ahwaz occurs early in the annals of Islam, but the date of its foundation is unknown. It was probably founded by the first Khalifs of the Ommiade dynasty; or, perhaps, these monarchs raised an insignificant town to its subsequent splendor. The zenith of its prosperity was attained under the earlier Khalifs of the house of Abbas, nor did it long survive their fall. Although the architectural decorations of the ruins of Ahwaz are Moslem, bearing

Arabic inscriptions in the early Cufic character, some intaglios on carnelian or oriental onyx, brought from thence, are of a higher antiquity than Mohammed. The city of Ahwaz lies on the banks of the river Karun (31° 20′ N. lat. 48° 50′, E. long.) in a flat and uncultivated country, abandoned by its former inhabitants to rapacious animals, and hordes of ferocious Arabs, who occasionally pitch their flying camps here, when in search of pasturage or plunder. The modern town of Ahwuz occupies but a small portion of the site of the old city, on the eastern bank of the Karun, and exhibits a mean and solitary appearance when contrasted with the immense mass of ruins. Its houses are almost entirely built of stone brought from the ruins, and it can only boast of one decent building, a mosque, apparently modern. The population at present does not exceed 1600 souls. Considerable traces are discernible of the *bund* or dyke that was thrown across the river, chiefly, if not entirely, to favour irrigation, by thus making a head of water. A part of this stone wall is still standing, remarkable for its state of preservation; it is in many places ten feet high, and nearly as many in breadth; while it extends upwards of one hundred feet in length, without any intermediate breach. Many single blocks in it measure eight and ten feet. The river dashes over the *bund* with great violence, and, being accelerated by the strong current of the Karun, the sound of the fall is heard from a considerable distance. Boats of every description are obliged to unload previous to an attempt at passing over, and even then the passage is attended with much danger, and they are frequently swamped. The river is one hundred and sixty yards in breadth at each side of the dyke, and of great depth. The shallowness below the town is caused by the great mass of masonry under the surface. Towards the south end of the town, there are several singular cavities, and a few water-mills erected between the rocks, the latter, probably, constructed since Kinneir's visit. Behind them are the remains of a bridge, and here, too, commences the mass of ruins, extending to least ten or twelve miles in a south-easterly direction, while their greatest breadth covers about half that space. All the mounds are covered with hewn stone. One of them is nearly two hundred feet high. In many parts flights of steps are in good preservation. At the base of this mass of ruins are graves, in which are found stones measuring five or six feet in length, several with Cufic inscriptions, and others with fret-work, indicative of an era subsequent to the Mohammedan. In every direction are found heaps of circular flat stones perforated in the centre, four, five, or six feet in diameter, and some with characters upon them—they have apparently been used for grinding. These circular stones appear in some places to have been used for the conveyance of water, and may be traced for great distances in successive rows in small dry rivulets, placed so firmly together, that it would require days to remove any of them. The above-mentioned large mound extends as far as the eye can reach, varying in height and breadth, and is the first in magnitude upon the plain. To the west of this is a mound entirely of stone, fifty feet high, and twenty feet broad, with several flights of steps traceable to its summit, but much mutilated and injured by the weather. About a mile to the east, separated by a deep ravine, stands an immense pile of materials, consisting of bricks, stone, and tile of various colours. The Arabs call it *kasr* or *palace*. Its ascent is gradual, but fatiguing from the numerous furrows, which have been apparently worn by water. The height is, at the lowest estimate, one hundred and fifty feet above the plain. At the summit are several floorings of stone, as fresh as if only recently laid down; together with several rounded troughs, some of which are of Persepolitan marble in its rough state. From numerous cavities start packs of jackals, and porcupine quills are strewed in every direction. One side of this mound is nearly perpendicular, so that it is impossible to descend. At its base the camel's thorn is plentiful, which, by its green appearance, relieves the landscape from the general gloom of sterility and dreariness. The *kasr* is about three miles from the east bank of the river. About half a mile north-west from the *kasr* is a circular mound measuring two hundred yards. At its base, a wall of masonry may be traced for twenty-one feet, the face of which is perfect and unbroken, and appears to have been the front of some building. To this mound is joined another ruined heap, covered with fragments of glazed tile, a coarse kind of crystal, pieces of alabaster, and bits of glass.

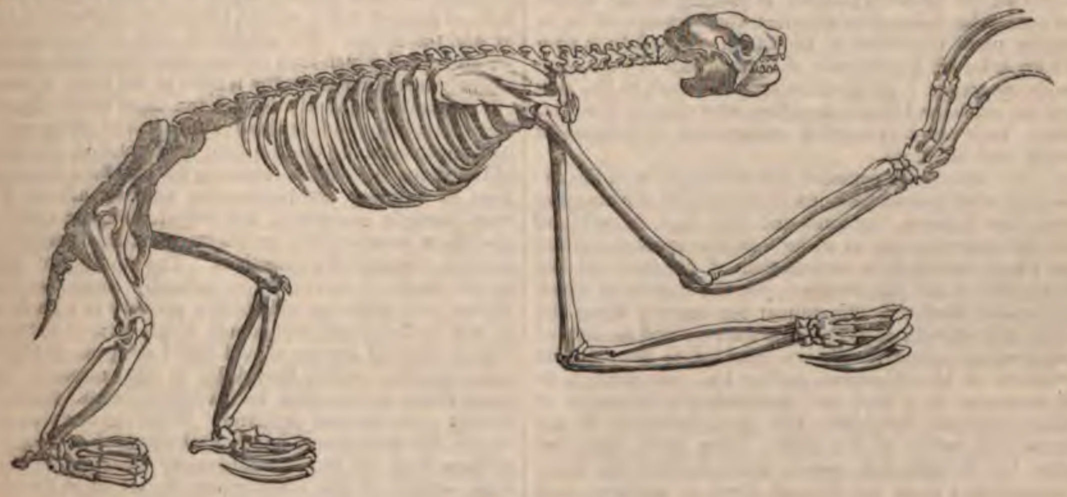
Several mounds form one connected chain of rude, unshapen, flaked rock, lying in such naturally-formed strata, that the very thought of any part of the materials having been accumulated by human labour is scarcely admissible. The soil on which these ruins rest appears to be soft and sandy. Perhaps the site was naturally elevated before the city was built. Glass of all colours is found in abundance, and the fragments of pottery are remarkably fresh. Many of the burnt bricks that lie on the surface of the mound appear to have borne some written character; but exposure to the weather, and probably occasional inundations, caused by the melting snows of the mountains in the upper country, have nearly effaced all traces of it. On the hewn stone, some characters are as fresh as from the sculptor's hands. No bitumen was observed on the bricks. The villagers say, that they find sometimes, when digging for bricks, small intaglios, generally denominated seals, and probably used as such, similar to those found at and near Babylon. The Arabs are always digging up and removing stones for the purpose of building; but a large city might be erected from the materials still remaining. The ruins of Ahwuz extend also on the west bank of the river in a northerly direction, exhibiting the same appearance as the mounds on the east side, but less in magnitude. Ahwuz is generally supposed to be much lower in antiquity than either Babylon, Persepolis, or Susa. Alexander navigated the Karun, but his historians do not mention Ahwuz.

It appears from the extracts from oriental writers made by Captain R. Taylor, that the sugar-cane was once largely cultivated round Ahwaz, and the sugar was exported to all parts. Ahwaz, in the height of its prosperity, belonged to the Khalifs, from whom it revolted. Ali-ibn-Mohammed took the field against them, and after a long and destructive war, the Khalifs triumphed; and from that time we may date the ruin of this great city. (See *Transac. of the London Asiatic Soc.* vol. ii.)

AI (*Bradypus*, Illiger), in zoology, a genus of mammals belonging to the order Edentata of the Règne Animal, and, together with the genus Unau or Cholæpus, composing a small family to which Baron Cuvier has given the appellation of Tardigrada, from the peculiar conformation of their extremities, and the remarkable slowness of their pace. Both these genera were formerly included by Linnæus in the same group, under the common name of Bradypus or Sloth; but later zoologists have separated them, on account of certain anomalies in their organic structure, which will be explained, and which certainly deserve to be considered as important generic characters. With this difference, however, it must be confessed, that the two genera of Sloths are closely approximated to one another in many essential details both of structure and economy; and this fact is the more remarkable and interesting, since the modifications upon which their generic distinction has been founded, are greater and, as we might naturally presume, more influential, than those which frequently characterize two different families.

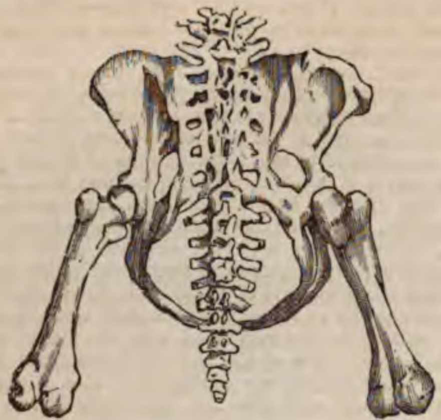
[Figure of the Sloth.]

The order Edentata comprises a number of genera, perhaps the most singular and anomalous among mammals, differing widely from all other quadrupeds, but unfortunately possessing so few natural affinities or relations of resemblance among themselves, that we cannot help regarding the order edentata as the most arbitrary and artificial of all the primary groups into which MM. Cuvier and Geoffroy have divided the mammalia. In other respects, every thing which relates to these animals, their habits and economy, but still more particularly their osteological structure, is in itself exceedingly interesting. The family of tardigrada, or sloths, are more especially deserving of attention, as well from the singularity of their physical structure, and the mistakes which have hitherto prevailed among naturalists concerning the habits and manners of these singular animals, as on account of the relation which they present in their osteological details to the megatherium, the most curious and anomalous of extinct animals. This family is distinguished from the other edentata by a short round head, and the presence both of molar and canine teeth, the incisors alone being deficient; but, above all, by the great length and singular structure of their arms, which, adapting them to a mode of progression altogether peculiar to themselves, and consequently disqualifying them for the exercise of that species of locomotion common to ordinary quadrupeds, has caused them to be considered as the most miserable and unfortunate of beings, imperfect monsters of creation, equally remarkable for their disgusting appearance and helpless condition. The valuable observations of a recent traveller have at length dissipated the obscurity which so long prevailed upon this subject, and have shown in this instance, as in all others, that every modification in nature is adapted to a wise and useful end; and that deformity and imperfection appear only when, from our own imperfect knowledge, we fail to discover the adaptation of organic structure to the habits and economy of particular beings.



[Skeleton of the Sloth.]

To enable us clearly to comprehend the nature and functions of these animals, it will be necessary to enter into a short description of parts of their osteological structure. The next view of the skeleton of the Ai seems to indicate a distortion of certain parts, and proportions altogether opposed to freedom of motion, at least of that kind of motion which we are familiar with in ordinary quadrupeds. The arm and fore-arm taken together are nearly twice as long as the leg and thigh, so that if the animal attempts to walk on all-fours, it is obliged to trail itself painfully and slowly on its elbows, and if it stands upright on the hind legs, the arms are so long that the fore-fingers touch the ground. This disproportion between the anterior and posterior extremities, obviously deprives these animals of the power of moving on a plain surface with that speed which is so admirable in the generality of quadrupeds; and, accordingly, we are assured by all observers, that their mode of progression, under these circumstances, is of the most slow and painful nature. The sloths, however, are not terrestrial animals, but live entirely among the thick branches of trees in the most extensive and solitary forests. This remarkable disproportion of their fore-arms is common to another genus of arboreal mammals, the real apes, in which, far from retarding their motions, this peculiar structure is of the most essential importance in adding to their agility. But the sloths partake of none of the accessory advantages which the apes possess. They have no opposable thumb; their fingers are short, and so perfectly rigid that the joints ossify at a very early period of the animal's life, leaving them totally incapable of individual motion, whilst they are at the same time so completely enveloped in the common integuments of the hand, that nothing is to be seen externally except the immense crooked claws with which they are provided. The wrist and ankle, also, are articulated or joined to the fore-arm and leg in an oblique direction; so that the palm or sole, instead of being directed downwards towards the surface of the ground, as in other animals, is turned inwards towards the body, in such a manner as to render it impossible for the sloth to place the sole of its foot straight down upon a level surface, but to compel it, under such circumstances, to rest upon the external edge of the foot. This position is obviously but ill-adapted for ease or facility of motion. But there is still another singularity in the structure of the foot of this animal which materially increases its difficulties of progression on a plain surface. This arises from the peculiar form of the last phalanx or joint of the fingers and toes, that, namely, which gives insertion to the claws, and which is articulated with the second phalanx in such a manner as to permit the fingers and claws to be strongly bent inwards along the palm and arm, but at the same time prevents the animal from raising them upwards or opening the hand beyond a certain position. This structure is exactly the reverse of what we observe in the common cat, which has the phalanxes of the toes formed in such a manner as to keep the claws habitually retracted or drawn up, so that it requires a considerable degree of muscular force to extend or depress them. In the sloths, on the contrary, they are naturally depressed in the position represented in the figure of the skeleton, and the muscular force is exerted to expand or open them. The claws themselves are of a size altogether enormous, surpassing the entire foot in length. They are so sharp and crooked that they readily seize upon the smallest inequalities in the bark of the trees and branches among which the animals habitually reside; and united to the great muscular strength and rigid formation of the extremities, furnish the most powerful weapons of defence. Nor are the form and articulation of the posterior extremities less singular than those of the anterior. The formation of the pelvis alone is of such a nature as to render it impossible for the sloths to walk after the manner of ordinary quadrupeds; and the mode in which the hind legs are articulated with the pelvis, to use the expression of Baron Cuvier, seems almost expressly arranged for the purpose of depriving the animal of the use of its legs altogether. 'If,' says M. Cuvier, 'we consider the sloths in the relations which they bear to other animals, the general laws of organization at present existing apply so little to their structure, the different parts of their body seem so completely contradictory of those laws of co-existence which we have found established in the rest of the animal kingdom, that we might be almost tempted to consider them as the remains of a former order of things, the living relics of that precedent nature of which we are obliged to seek the other ruins beneath the surface of the earth, and that they escaped, by some miracle, the catastrophe which destroyed their contemporary species.'



[Formation of Pelvis.]

The false and exaggerated opinions which have been entertained concerning the functions and condition of these animals, arise from preconceived notions which do not apply in any manner to the conformation of the sloths. If placed upon a plain surface, the sloth moves indeed with great pain and difficulty and only by seizing upon the little asperities which he finds in his way, and by that means dragging his body slowly forwards, just as we may observe a bat to do under similar circumstances. But this is a situation equally foreign to the habits and economy both of the sloth and of the bat; and we are no more justified in judging of the nature of the one under these circumstances, than we should be in reasoning upon the habits of the other. The sloth is eminently an arboreal quadruped: it is produced, it lives, and it dies in the trees; it never voluntarily descends to the surface of the earth, and those, therefore, who observe it in that situation, have not a favourable opportunity of judging of its nature and functions.

Yet if we attentively consider the organization of the extremities as already described, it will appear that the amazing disproportion between the hind and fore legs in point of length, the immoveableness of the toes, the reversed position of the claws, the oblique articulation of the feet, and the great rigidity of all the members, are circumstances which should equally disqualify this animal for moving along the branches of trees with anything like the ease and security of the squirrel or monkey. We are indebted to the valuable observations of Mr. Waterton, during his 'wanderings' in South America, for a final and satisfactory explanation of all these apparent difficulties and inconsistencies in the structure and habits of the sloth. 'The sloth,' says this traveller, 'in its wild state, spends its whole life in the trees, and never leaves them but through force or accident; and what is more extraordinary, not *upon* the branches like the squirrel and monkey, *but under them*. He moves suspended from the branch, he rests suspended from the branch, and he sleeps suspended from the branch. Hence his seemingly bungled composition is at once accounted for; and in lieu of the sloth leading a painful life and entailing a melancholy existence upon its progeny, it is but fair to conclude that it just enjoys life as much as any other animal, and that its extraordinary formation and singular habits are but further proofs to engage us to admire the wonderful works of Omnipotence.' Nor are the motions of this animal so slow while suspended in this strange position, nor his habitat so circumscribed as naturalists have hitherto imagined. 'The Indians,' continues Mr. Waterton, 'have a saying, that when the wind blows the sloths begin to travel. In fact, during calm weather they remain tranquil, probably not liking to cling to the brittle extremities of the branches, lest they should break whilst the animals are passing from one tree to another; but as soon as the wind rises the branches of the neighbouring trees become interwoven, and then the sloth seizes hold of them and pursues his journey in safety. He travels at a good round pace, and were you to see him, as I have done, passing from tree to tree, you would never think of calling him a sloth.' Though the merit of explaining and accounting for the many apparent inconsistencies and anomalies observable in the conformation of these animals is undoubtedly due to Mr. Waterton, yet their habit of resting suspended from a branch or perch, was long since noticed by different authors, and is particularly described in a communication to Buffon from the Marquis de Montmirail, in whose menagerie a sloth was preserved for upwards of three years. Stedman, in his *History of Surinam*, has an engraving of a sloth in this position, which we have copied, as illustrating its singular mode of progression.

[Mode of Progression.]

The conformation of the extremities is not the only part of its anatomy in which the sloth differs from ordinary mammals. The number and form of the bones which compose the trunk, the nature of its teeth, and the conformation of its stomach and intestines, are all peculiar. The stomach is divided by transverse ligatures into four separate compartments, which bear a distant resemblance to the four stomachs of ruminating animals: they do not, however, exercise the functions of these organs, nor do the sloths regurgitate their food, or subject it to a second process of mastication like the ox and the sheep. The intestines, also, are unusually short for an animal which lives entirely upon vegetable substances, scarcely equalling twice the length of the body, whilst those of ruminants frequently exceed ten times those dimensions. Their simplicity and diminutive size in the sloths appear to be compensated by the superior and unusual complication of the stomach,—which, retaining the food for a longer period than in ordinary non-ruminating animals, allows it to be more perfectly macerated, and prepared for the action of the absorbent vessels which imbibe its nutritious particles in its passage through the intestines. The number of vertebræ in the necks of mammals is generally seven, so that the whales and dolphins, which have scarcely any neck at all, as well as the giraffe and camel, which have it developed in a most unusual degree, are all found to agree in this particular, however widely they differ in other respects: the Ai alone forms an exception to this otherwise universal rule in having nine cervical vertebræ. What renders this circumstance still more surprising is, that the neck of the Ai, notwithstanding its two supernumerary vertebræ, is far from long,—being, on the contrary, much too short for its long fore-legs, if it were compelled to seek its food on the ground, like other animals. But this defect is compensated, as well by the nature of the situation which it habitually occupies, suspended from the horizontal branches of the trees, as by its power of using the fore-paw as a hand in conveying the food to its mouth, which, notwithstanding the rigidity of its members, it does with great address with one paw, whilst it clings firmly to the branches by means of the other three.

The dental system of the sloths is the most simple that can well be conceived. They have no incisor teeth, but canines and molars only; and in the Ai the canines are diminutive, and in all respects very similar to the other teeth. The molar teeth are universally eight in the upper jaw and six in the lower, four and three on either side respectively. Their construction is most simple, consisting merely of a cylinder of bone, enveloped in enamel, and hollow at both ends,—at the upper by continual detrition, and at the under by default of ossification. They have no lamina of enamel penetrating the body of the tooth, as in other herbivorous animals, which renders them such effective instruments in grinding and masticating vegetable substances. Hence it results that the mastication of the sloth must be extremely imperfect, though the defect of dentition is probably compensated, in some degree, by the superior complication of the stomach.

The genus Ai, for which the name of Bradypus has been more properly reserved, differs from the Unau, Cholœpus, in many respects, but at the same time approximates more nearly to it than any other known animal: these two genera, together with the extinct fossil animals which have been called Megatherium and Megalonyx, and which, with the form and organization of a sloth, nearly equalled the elephant in size, constitute the Cuvierian family, Tardigrada. Besides the difference of the canine teeth, which are completely developed in the Unau, and in the Ai of the same form and subject to the same detrition as the molars, these two genera are distinguished from one another by the number of toes on the fore-feet, which are three in the Ai and only two in the Unau; by the comparative length of the fore-arms, which are much longer in the former than in the latter; by the number of cervical vertebræ in the Ai, as already mentioned; by the equally-unusual number of ribs in the Unau, which amount to no fewer than forty-six, the greatest number hitherto found in any mammal, the Ai having but thirty-two; and by numerous other modifications which it is unnecessary to enumerate.

The sloths are known to bring forth, and suckle their young like ordinary quadrupeds. For this purpose they have two mammæ, which are situated on the breast; and the young sloth, from the moment of its birth, adheres to the body of its parent till it acquires sufficient size and strength to shift for itself. The head of the Ai is short, the face small and round like that of the American monkeys, the ears concealed in the long hair which surrounds them, the eyes small and deeply sunk in the head, and the tail a mere rudiment. The Ai is found only in the most gloomy and retired tropical forests of South America. The Indians like his flesh, and are in continual pursuit of him.

Naturalists reckon two distinct species of the Ai, and three or four varieties, some of which may probably be found to be specifically different, when they come to be dissected and carefully compared with one another. 1. The Common Ai, (Bradypus Communis,) has a short round head, furnished with coarse shaggy hair, disposed on the crown in verging rays, like that of the human species: the face is of a yellowish colour, covered with very short hair, whilst that of the body and extremities is universally long and shaggy; the eyes are encircled by a brown ring; the hair of the body varied with irregular patches of dark and light brown, or silvery white: between the shoulders there is an oval patch of short orange-coloured hair, of a finer quality than that found on other parts of the body, and divided in the centre by a longitudinal black stripe; the throat and breast are frequently of a light straw colour. The texture of the hair is altogether peculiar, and more nearly resembles dry hay, or grass shrivelled and withered by the sun, than the hair of ordinary quadrupeds. It is coarse and flattened at the extremity, but as small at the root as the finest spider's web; and its dry and withered appearance forms the Ai's principal security against its pursuers, as it renders it extremely difficult to detect it whilst at rest among the branches covered with bark and moss of the same colour; it is only when in motion that it can be readily distinguished from the trunk beneath which it hangs suspended. In other respects, different individuals of this species differ considerably from one another, in the shades and disposition of their colours, and in the intensity of the mark between the shoulders; some even want this latter mark altogether, others are of a uniform ash colour over the whole body, and there are others still, which have the hair of the head parted in the centre, and hanging down upon each side; but whether these constitute distinct species or mere varieties of the common Ai, is a point hitherto undetermined; the cabinets of Europe do not afford sufficient materials for an extensive comparison, and no naturalist has ever examined the Ais with this view in their native regions.

2. The Collared Ai (*Bradypus collaris*), is a very distinct species, even in the bony structure of its cranium. Its face is naked and of a black colour; the hair of its body less flattened, and withered-looking than in the common species; the forehead, temples, chin, throat, and breast covered with reddish or rust-coloured hair, slightly frizzled; on the crown of the head it is long and yellow, and on the rest of the body pale orange: but the most distinguishing mark of the species is a large black collar which completely surrounds the neck, and from which its specific name of *collaris* is derived. Beneath this outer coat there is an inner one of very fine fur, which is of a dark brown colour on the collar, but gradually diminishes in intensity towards the croup, where it is entirely white.

Both these species feed upon the leaves of trees, and bring forth but a single young one at a birth. When in motion in the forests they emit a feeble, plaintive cry, resembling the word Ai, and which is the origin of the name they bear among the Europeans settled in America. They are extremely retentive of life, and have been seen to move their legs and exhibit other symptoms of vivacity, a full half hour after being deprived of the heart and other viscera.

AIA-SOLOUK, or **AIA-SALUK**, a small village of Asia Minor, on the banks of the Kitchik Minder, the old Caystrus; many remains are found there, which have given rise to the supposition that it occupies the site of Ephesus. But the remains of Ephesus are two miles lower down the river. [See Ephesus, for an account of both places.]

AIDE-DE-CAMP, a French term, denoting a military officer usually of the rank of captain, one or more of whom is attached to every general officer, and conveys all his orders to the different parts of his command. A field-marshal is entitled to four, a lieutenant-general to two, and a major-general to one. The king appoints as many aides-de-camp as he pleases, and this situation confers the rank of colonel.

AIDS, called by ancient legal writers *auxilia*, were a kind of pecuniary tribute paid by a feudal vassal to his superior or lord, on occasions of peculiar emergency. The kinds of aids of most usual occurrence were, 1st, when the lord made his eldest son a knight;—this ceremony occasioned considerable expense, and entitled the lord to call upon his tenant for extraordinary assistance: 2d, when the lord gave his eldest daughter in marriage, he had her dower to provide, and was entitled by law to claim a contribution from his tenants for this purpose. The amount of these two kinds of aid was limited to a certain sum by the statute Westminster 1. c. 36, namely, at 20*s.* for a knight's fee, and at 20*s.* for every 20*l.* per annum value of socage lands, and so on in proportion. The third species of aid, which was to ransom the lord's person when taken prisoner, was of less frequent occurrence than the other two, and was of necessity altogether uncertain in amount; because, if the lord were taken prisoner, it was absolutely necessary to restore him, however exorbitant the required ransom might be. In the more ancient treatises on feudal tenures, there is a vast collection of abstruse learning upon the various kinds of aids; but as aids for knighting the lord's son and marrying the lord's daughter are expressly abolished by the stat. 12 Car. II. c. 24. and as the aid for ransoming the lord's person is now become obsolete, the learning upon these subjects has long lost all practical utility, and is become merely matter of historical curiosity.

AIKIN, JOHN, M.D., was the only son of the Rev. John Aikin, D.D., for many years tutor in divinity at the dissenting academy of Warrington in Lancashire. John was born at the village of Kibworth-Harcourt in Leicestershire, on the 15th January, 1747. Here, and afterwards at Warrington, he received a classical education under his father, from whom he imbibed that love of letters for which he was distinguished through life.

Having made choice of the medical profession, he was at an early age articled to a surgeon and apothecary at Uppingham, in Rutlandshire, where he remained for three years, and then went to pursue his studies at the University of Edinburgh. Having continued here during two winters, he returned to England in May, 1766, and after paying a short visit to Warrington, renewed his medical studies at Manchester. After a residence of three years in Manchester, he proceeded to London, and joined the class of Dr. William Hunter.

The first field which he chose for his professional exertions was the city of Chester, where he settled in the autumn of 1770, and here his earliest medical work was published. This was entitled *Observations on the External Use of Preparations of Lead, with some general Remarks on Topical Medicines.* This work met with a satisfactory reception from the members of the medical profession, and is still held in esteem. Not meeting with sufficient encouragement at Chester, in little more than a year he removed to Warrington, where he immediately succeeded in obtaining a moderate amount of practice. Shortly after this time, he published a pamphlet entitled *Thoughts on Hospitals*, which was well received both by the medical profession and by the public generally. Mr. Aikin's earliest publication, unconnected with his profession, was a small volume, entitled *Essays on Song Writing;* this was first published in 1772, and was speedily carried through a second edition. Very many years afterwards this little work was remodelled, and published with additions, under the title of *Vocal Poetry*.

In the year just mentioned, Mr. Aikin married Miss Martha Jennings, the daughter of his maternal uncle, a union from which he derived the truest domestic happiness during the remaining years of his lengthened life. In 1773, he assisted his sister, Mrs. Barbauld, in the composition of a small volume of *Miscellaneous Pieces in Prose*, and in the following year published a translation of *The Life of Agricola*, by Tacitus, with copious notes, which was soon followed by a translation of *The Manners of the Germans*, by the same author. His next was *A Specimen of the Medical Biography of Great Britain*, and this essay meeting with considerable attention from many professional and literary persons of celebrity, by whom he was incited to pursue the subject, he published, five years after, an octavo volume of *Biographical Memoirs of Medicine in Great Britain from the Revival of Literature to the Time of Hervey*. It was Mr. Aikin's intention to still further extend the work, but it was found impossible for him, as then situated, to procure materials for completing his purpose in a satisfactory manner.

To these literary occupations, and to the labour attendant on an extensive medical practice, were at this time added the task of delivering chemical lectures to the students at the Warrington academy, and the charge of privately instructing a few medical pupils.

The next publication of any consequence which we owe to Mr. Aikin appeared in 1784. This was a much enlarged and corrected edition of Lewis's *Experimental History of the Materia Medica*, in 1 vol. 4to., the preparation of which had occupied him during a large portion of the preceding year. About the same time was published the first of his works composed for the benefit of young people. This, which was entitled *The Calendar of Nature*, contained an instructive sketch of many striking circumstances in animal and vegetable life, and of the changes attendant upon the revolution of the seasons in our latitude. This little piece was republished fifteen years after, and entitled *The Natural History of the Year*.

Having lost his father by death, and the breaking up of the Warrington academy having scattered the literary and scientific society of that town, so much in accordance with his tastes, Mr. Aikin determined, upon the advice of many professional friends, to take his degree as a doctor of medicine, and to seek some more promising field than Warrington for the employment of his professional talents. With this view he proceeded, in July, 1784, to the University of Leyden, where, having gone through the necessary examinations, he received his degree, and returned to England.

At the end of some months spent in inquiries after a suitable opening for practice, Dr. Aikin was persuaded that such an opportunity presented itself at Yarmouth, in Norfolk, from many of the inhabitants of which place he received promises of support. The experiment of a year convinced the doctor, however, that the ground he had chosen was too far pre-occupied as a medical station to offer reasonable expectation of success, and he then removed to London, where he appeared to be rapidly making his way, when the retirement from practice of one of his former competitors at Yarmouth occasioned an invitation for his return to be forwarded to him from so large a number of the respectable inhabitants, that he felt it impossible, with prudence, to hesitate, and returned to that town after only a very few months' absence.

In 1788, Dr. Aikin wrote his popular little work, *England Delineated*, and also produced a new edition of Lewis's *Materia Medica*, with all the alterations called for by the then recent progress of medical science. Two years afterwards, upon the refusal of the legislature to repeal the Test and Corporation acts, Dr. Aikin, who was bound by the ties of birth and connexions, as well as by principle, to the dissenters, employed his pen as their champion, and published two strongly-expressed pamphlets on the question. This act of partisanship produced him many enemies. The clergy with their connexions, as well as the members of the corporation, chose to consider themselves thereby absolved from their promises of support, which they secretly transferred to another physician, who was invited by them to settle in the town. Dr. Aikin's situation was, in consequence, rendered so much less lucrative and agreeable, that early in 1792 he again removed his family to London, where he recommenced his medical practice.

In the same year, Dr. Aikin, who had before assisted Howard in preparing his works for the press, published, in one small octavo volume, *A View of the Character and Public Services of the late John Howard, Esq., LL.D., F.R.S.* This work comprises an account of the principal events of Mr. Howard's life, and of the origin and progress of his inquiries into the state of prisons, hospitals, and lazarettos, and it gives a summary of his character and exertions; a task for which Dr. Aikin was peculiarly qualified, as well by the continual and unreserved intercourse which had passed between Howard and himself, as by the peculiar turn of his own mind, which led him to view with interest approaching to enthusiasm every scheme which promised in any way to diminish human suffering.

The first volume of *Evenings at Home*, the most popular, and probably also the most useful of all Dr. Aikin's works, was published very soon after he had settled in London. The volumes of this work appeared successively, the sixth and last in June, 1795. This work was the joint production of Dr. Aikin, and his sister, Mrs. Barbauld, whose contributions, however, did not exceed half a volume in the whole. The object of these volumes was a favourite one with their authors, who desired to teach things rather than words. In the execution of the task, they presented, in a manner sufficiently attractive to engage the attention of young persons, a good deal of natural history, with some of the elements of chemistry and mineralogy; but the principal charm and value of the work consist in its just views of human character, and in the uncompromising integrity visible in every line. 'Things by their Right Names' is the title of one of the papers inserted in these volumes, which might, with great propriety, have been adopted for the entire work. At the expiration of nearly half a century from its first appearance, 'Evenings at Home' is still in possession of public favour, and the work has been translated into almost all the European languages.

In the beginning of 1794 Dr. Aikin published a volume of *Letters from a Father to his Son on various Topics relative to Literature and the Conduct of Life*. This may be characterised as an original work; as it was not designed for children, it is less elementary than the 'Evenings at Home.' The chief aim of these letters, thirty in number, appears to be to obviate prejudices, to lead the person who shall study them to judge and enjoy and act for himself, inculcating freedom of thinking on all occasions, lest the deference to authorities on small matters 'should induce the same habit of passive compliance in affairs of capital importance.'

In 1795 Dr. Aikin published in a large quarto volume, *A Description of the Country from thirty to forty Miles round Manchester*. The author brought considerable local knowledge to the execution of this task, which is written with much clearness and animation, and displays throughout the doctor's characteristic good sense and freedom from vulgar prejudices.

On the establishment of the *Monthly Magazine*, in the beginning of 1796, Dr. Aikin became its literary editor, the political portion being placed in other hands. This office the doctor retained for ten years with considerable credit to his literary reputation. At the close of the same year (1796) Dr. Aikin engaged in his greatest work, the *General Biography*, which employed a large portion of his time during nineteen years, and was extended to ten quarto volumes. In this undertaking he had the assistance, first of Dr. Enfield, and, after his decease, of the late Dr. Thomas Morgan. The portion of matter contributed by Dr. Aikin amounted to nearly one half the contents of the volumes.

His health, which had been declining from the summer of 1796, became so seriously bad in the spring of 1798, that Dr. Aikin was then obliged to have recourse to the relaxation of a country life; and he passed four months at Dorking, in Surrey. Even under these circumstances, however, he gave evidence of the activity of his mind by producing a second volume of *Letters from a Father to his Son.*

So little benefit to his health was derived from this residence at Dorking, that a total renunciation of London and of his profession became a matter of necessity, and he accordingly removed, in October, 1798, to Stoke Newington, where he continued to reside during the remainder of his life. Dr. Aikin did not, however, by any means relax in his literary exertions, but, on the contrary, undertook, in addition to the 'Monthly Magazine' and the 'Biography,' to superintend a new edition of Dr. Johnson's poets, and in the execution of this engagement he supplied several critical prefaces and biographical notices which had been omitted by Dr. Johnson. During 1801 Dr. Aikin wrote an instructive little volume for the use of young persons, entitled, *The Arts of Life.* In this work a clear view is given, under the three heads of food, clothing, and shelter, both of the arts of first necessity and of those which minister to our comfort and convenience. This volume was followed in a very few months by *The Woodland Companion, or a Brief Description of British Trees, with some Account of their Uses.* In 1803 appeared his *Letters to a Young Lady on a Course of English Poetry.* In 1806, when his connexion ceased with the 'Monthly Magazine,' Dr. Aikin was engaged in establishing a new periodical work, which was called *The Athenæum*, and he continued to be its editor during the two and a half years that the publication was continued.

Towards the close of 1811 Dr. Aikin accepted the office of editor of Dodsley's 'Annual Register,' an undertaking which occupied a considerable portion of his time, so that he had now ample occupation without any attempts at original composition. Constant employment appears to have been a necessary condition of his existence, and on the completion of the *General Biography*, in the spring of 1815, he formed a collection entitled *Select Works of the British Poets*, to which he supplied short biographical and critical notices. He was also a contributor to the *Annals of the Reign of George III.* which were published in two vols. 8vo. The first edition of the work ended with the peace of Paris, in 1815, but, in a second edition, the *Annals* were brought down to the death of George III.

Early in the spring of 1817, a few months after the appearance of the *Annals*, Dr. Aikin experienced a dangerous stroke of paralysis, which for a time deprived him of his faculties. After a few months he partially recovered, and survived more than five years. He died of a stroke of apoplexy, December 7, 1822.

Dr. Aikin's temper was naturally cheerful and affectionate, a disposition which he cultivated as a principle. His attachment to the cause of rational freedom was ardent and uniform. His diligence in the performance of whatever he undertook was unwearied. His moral purity was unblemished.

AIMOIN, a benedictine monk, and an historian. He was a native of Ville Franche, in the province of Perigord. He wrote, or rather began, a history of the French, which he dedicated to his patron and principal, Abbon, Abbot of Fleuri-sur-Loire. It is said in his preface, that he intended to give an account of the origin of the French nation, and to bring his narrative down to Pepin le Bref, father of Charlemain (741); but, either he did not accomplish his task, or some part of it has been lost, for what we have of him brings us down only to the sixteenth year of Clovis II. (650). Two books were afterwards added by an unknown writer. This history of Aimoin is not esteemed; it is incorrect, and he does not dwell sufficiently upon the events which he has to relate. His best work, and also the most interesting, is an account of the life of Abbon; it contains a great number of anecdotes, and frequently alludes to the political and public circumstances of the times. Aimoin died in 1008.

AIN, a river in France which, rising among the slopes of the Jura, pursues a S.S.W. course into the Rhone. Its length is more than ninety miles, and its junction with the Rhone takes place about twenty miles above Lyon. Although not a stream of any great importance, it serves to give name to a department pretty nearly coincident with the district of Bresse, Bougey, Dombes, &c., sub-divisions of the former province of Bourgogne (Burgundy). This river separates the department into two parts of nearly equal extent, comprising, between them, about 1727 square miles, and containing, at the end of 1826, a population of about 342,000 persons. It sends five deputies, and is subdivided into five arrondissements. The district on the western or right bank of the Ain, though marshy in some parts, produces harvests sufficient for the inhabitants, whose chief occupation is agriculture: the eastern district, which is crowned by the ridges of the Jura and the intervening vallies, affords pasturage for a great number of horses and sheep, and yields iron and stone, which the inhabitants work. The best lithographic stones in France are procured here. The Lake of Nantua, which is about the middle of the department, is not less than 1300 feet above the level of the sea. In the S.W. of the department are numerous pools or ponds, which are made dry during part of the year for cultivation; but they are very injurious to the health of the people. Among the manufactures carried on in different places, are those of cloth at Montluel, near the Rhone, a town of about 4000 inhabitants, and at the capital of the department, Bourg (see Bourg); of linen and paper at Nantua (population 3700), in one of the passes of the Jura; and of watches at Bourg and Ferney, the latter celebrated as the residence of Voltaire, by whom this branch of industry was introduced there. The chief towns beside those already noticed are Belley (population 5300), near the S.E. corner of the department; Gex (population 2600), at the N.E. extremity; and Trevoux (population 3000), on the Saône. These, with Nantua, are the seats of sub-prefects; and we may add to them Thoissey and Pont-de-Vaux, near the Saône. Bourg, the capital, is on the Reyssouse, a feeder of the Saône, and contains between 8000 and 9000 inhabitants. The Saône bounds the department on the west; the Rhone (on the right or French bank of which is the Jura) limits it on the south and east, and the tributaries of these two streams water it; on the north it has the departments of Jura, and Saône and Loire.

AIN-TAB, a town of Syria (about 37° N. lat., and perhaps about 37° 35′ E. long.), near the sources of the Kouaik or river of Aleppo; and hence its name, from the Arabic *Ain*, eye or fountain. It is about seventy miles N. by E. from Aleppo. It is a large town, inhabited both by Mohammedans, Greeks, and Armenian Christians. The Turkish is the common language. The houses are built of stone, which is found in the neighbourhood: some of the streets are refreshed by streams of water, and the air is wholesome. On the north is a castle standing on an artificial elevation. The extensive burying-ground, looking at a distance like a large suburb, lies to the south of the town. The manufactures are, leather made of goat's skin dyed red and yellow, cottons, and various coloured woollens. The chief trade is in leather and raw hides.

Ain-tab is supposed, but without any reason, to have been anciently called Antiocheia ad Taurum. It was taken by Tamerlane in 1400. The population was computed at about 20,000 some years ago. [See Browne's *Travels*, p. 411.]

AINSWORTH, ROBERT, the author of a well-known *Latin Dictionary.* He was born at Woodyale, about four miles from Manchester, in September, 1660. Having received, or at least completed, his education at Bolton, he afterwards taught a school for some time in that town. He then came to London, and formed an establishment at Bethnal Green, from which he removed, first to Hackney, and afterwards to other villages in the neighbourhood of the metropolis. It is said to have been about the year 1714 that he was induced by the offers of the booksellers to commence the compilation of his Dictionary; but the execution of the work was frequently suspended, and it did not appear till 1736. He tells us himself, indeed, that it had been begun more than twenty years before. The first edition, which was dedicated to Dr. Mead in a well-written Latin address, was in one volume quarto; and it was the only one published during the lifetime of the author, who died at London on the 4th of April, 1743, and was buried at Poplar, where an inscription of his own composition, in Latin verse, was placed over his remains and those of his wife. Having acquired a competency, he had retired from teaching for some time before his death. These particulars are given in a notice prefixed to the second edition of his Dictionary. Dr. Kippis, in his edition of the *Biographia Britannica*, adds, from private information, that in the latter part of his life he used to be fond of rummaging in the shops of the low brokers; by which means he often picked up old coins and other valuable curiosities at little expense. He is said to have written some Latin poems; and he also published *Proposals for making Education less Chargeable*, and some other treatises, the list of which may be seen in Watt's *Bibliotheca;*

but his Dictionary is the only work for which he is now remembered. A second edition of it, edited by Mr. Samuel Patrick, appeared in two volumes, quarto, 1746, and it has since been frequently republished. One edition, which came out in 1752, is in two folio volumes, and used to be in some request as a handsome specimen of typography. It was superintended by the Rev. William Young, the supposed original of Fielding's Parson Adams. Another, in two volumes, quarto, was published in 1773, by Dr. Thomas Morell, the author of the *Lexicon of Greek Prosody*. Both Young and Morell also edited Abridgments of Ainsworth's Dictionary, which, until lately, were much used in schools. There is also an abridgment of the work, published in two volumes, octavo, in 1759, by Mr. Thomas. The latest and best edition of the larger work is that which appeared in 1816, in one volume, quarto, under the care of Dr. Carey. This Dictionary, regarded as a mere word-book, is a laborious and useful work; but it has no claim to be considered as a philosophical exposition of the etymology of the Latin language, or as anything like a complete exhibition of the usage of words by Latin authors. Notwithstanding the corrections which it has received from the labours of its successive editors, it still remains disfigured by many errors and deficiencies, which could scarcely have been avoided when it was first compiled, but which leave the book a great way behind the present improved state of philological learning.

AIR. This word is derived from the Greek and Latin *aer*. Though generally applied only to the material of the atmosphere, this term was, about the middle of the last century, extended to all the gases, as they were successively discovered, with a distinctive name for each. Though we confine ourselves here to the properties of atmospheric air only, we give the references to the modern names of the principal *airs*, as they were then called, which will be found mentioned in the chemical works of the last century.

Dephlogisticated Air, Empyreal Air, Vital Air,	see	Oxygen.
Phlogisticated Air,	see	Nitrogen.
Nitrous Air,	see	Nitric Oxide. Deutoxide of Nitrogen.
Dephlogisticated Nitrous Air,	see	Nitrous Oxide. Protoxide of Nitrogen.
Inflammable Air,	see	Hydrogen.
Fixed Air,	see	Carbonic Acid.
Alkaline Air,	see	Ammonia.

The air which envelops the globe is a *mixture* of two of these simple substances, to which chemists have given the name of *elementary*; viz., oxygen and nitrogen, with a very small proportion of carbonic acid, and water in the state of vapour. The two last are considered as accidental ingredients, and not constituent parts; as well on account of the smallness of their quantity, as because they occur in different proportions at different times. Speaking according to the language of the ATOMIC THEORY, air is composed of one equivalent of oxygen and two of nitrogen, or its atom is one atom of oxygen united with two of nitrogen. The atomic weights of oxygen and nitrogen being as 8 to 14, the proportion between the weights of the two contained in any quantity of air will be that of 8 to 28 or 2 to 7, that is, nine grains of air contain two grains of oxygen, and seven of nitrogen. The best experiments are found to agree very nearly with this, when the air is perfectly pure. In measuring these proportions by *volume*, as it is called, that is, ascertaining the relative spaces which would be occupied by the gases which form air when at the same pressure and temperature, it is found that one cubic inch of oxygen, mixed with four of nitrogen, in a vessel containing five cubic inches, will fill it with air of the same pressure and temperature as the oxygen and nitrogen.

The quantity of carbonic acid gas found in air, varies from three to eight parts out of a thousand in weight; and the quantity of water in a state of vapour is very variable, but is not generally more than 1¼ per cent. of the whole weight. The proportions of oxygen and nitrogen are found not to vary sensibly either throughout the whole globe, or the heights of the surrounding atmosphere. This was tried by M. Gay Lussac on air which he brought down with him from a height of 22,000 feet above the level of the sea. [See BALLOON.]

A thousand cubic inches of dry air, the barometer standing at thirty inches, and Fahrenheit's thermometer at 60°, weigh about 305 grains. This result is at present considered as, perhaps, too small by a number of grains not exceeding six; that is, the weight of the above volume of air may possibly be as much as 311 grains. Biot and Thénard agree in stating the latter, and the former has been long used by British chemists, on the authority of Sir G. Shuckburgh. The same bulk of water, at the same pressure and temperature, weighs 252,525 grains; that is, water must be reckoned as about 828 or 812 times as heavy as air, according as we prefer the first or second determination above-cited.

We have stated that the air is a *mixture* of oxygen and nitrogen, and not a *chemical combination*. In what the difference consists, it is impossible at present to say; but the distinction may be illustrated by the following experiment, which we introduce the more readily, as we shall afterwards have occasion to refer to it. If eight grains of oxygen gas, and one grain of hydrogen, be confined in a glass tube from which the air has been previously excluded, they may be mixed in that state, and the *mixture* thus formed will not prevent either gas from separating from the other, and combining with any third body. That is, the oxygen, for example, will combine as readily with any substance which has a great affinity for it, as if the hydrogen were not present. But if a succession of electric sparks be passed through the tube, a new substance is formed out of the oxygen and hydrogen, by some species of mutual connexion very different from the former one, and which has the name of *chemical combination*. Nine grains of common water are formed from the eight of oxygen and one of hydrogen. The oxygen will not now easily be separated from the hydrogen by the application of a third substance, and there are few for which the oxygen has a greater *affinity* than for the hydrogen. The general characters which distinguish chemical combination from simple mixture, are, that in the former there is usually an alteration in the SPECIFIC GRAVITY, REFRACTIVE POWER, law of DILATATION from heat, &c.; that is, the specific gravity for example, of the compound, does not follow the rule for determining the specific gravity of the MIXTURE (which see) from those of the ingredients. It is therefore argued that when, as happens with regard to the air, no change takes place in any of the above-mentioned phenomena, other than might be directly inferred from our knowledge of the component elements, the compound should receive the name of a mixture, and not of a chemical combination.

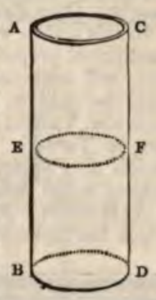
We have seen in the experiments already cited, that two elements which, when properly combined, produce a substance very different from either, may be placed in juxtaposition (such as is produced by mere mixture) without any such consequence following. If nitrogen and oxygen formed no other compound except atmospheric air, we might, perhaps, call the latter a chemical compound; but we should then be obliged to say, that the affinity of nitrogen for oxygen was singularly small. But the contrary of this is the fact. One equivalent of nitrogen may unite with one, two, three, four, or five equivalents of oxygen, forming the *nitrous* and *nitric oxides*, the *hyponitrous acid*, and the *nitrous* and *nitric acids*; all of which have every character of chemical combinations. It must be acknowledged, however, that it is difficult to account for the constant proportion of the oxygen and nitrogen in every part of the atmosphere and in every part of the globe. The explanations which have been proposed seem inconclusive.

The composition of air may be ascertained either synthetically or analytically. Synthetically, by mixing the proportions already noticed of oxygen and nitrogen; in which case it is found, that the mixture differs in no respect from common air. Analytically, by an experiment similar to the one already cited; in which, however, it is presumed, that we know the composition of water. If hydrogen be added to or mixed with a portion of common air, and the electric spark be passed repeatedly through the mixture, it will be found that the hydrogen has combined with eight times its weight of oxygen, (if there be so much,) and has produced nine times its weight of water. In this way, by trial, the quantity of hydrogen may be found which will combine with all the oxygen in the mixture, and the remainder is then found to be simply nitrogen.

Such are the principal chemical properties of air. For its effects upon animal life, see RESPIRATION.

We have already observed that the air, in common with all other bodies, has weight. This is proved by weighing a bottle which contains air in a very delicate balance, and then by repeating the process after the air has been exhausted from the bottle by the air-pump. From this we are immediately led to conclude that, like all other heavy fluids, it exercises pressure upon all substances which are in contact with it. But this was not the order of discovery. The pressure was ascertained long before there was any other reason except analogy for inferring the weight, and the latter discovery was a consequence of the former. It is true, that Aristotle (Stanley's *History of Philosophy*, *Aristotle*, part 2, chap. vii.) expressly mentions that air has weight, and even cites the experiment of a bladder, which he asserts weighs more when filled with air than when empty: but his followers of the middle ages entirely abandoned the doctrine. We shall speak more at length of the discovery, under the heads BAROMETER and ATMOSPHERE. It is here sufficient to observe, that the density of the air depends upon, and is a consequence of, the pressure of the superincumbent atmosphere. For the air is an elastic fluid, that is, its bulk increases, and its density diminishes, whenever the exterior pressure is wholly or partially removed. Let a loose bladder, tied at the mouth, and not so full of air as to be distended, be placed under the receiver of an air-pump, so that the air which presses the outside of the bladder can be exhausted. The interior air will expand so soon as the exhaustion begins, will presently distend the bladder to its fullest dimensions, and in some cases will even burst it. On the re-admission of the air into the space surrounding the bladder, the latter will gradually resume its former dimensions, and its withered or flaccid appearance.

As we ascend the atmosphere, the superincumbent column of air becomes of less weight, and the density becomes less; that is, a cubic foot at the height of 1000 feet above the ground is not so heavy, or does not contain so much air, as a cubic foot at the surface of the earth: which is thus explained. The air having in itself a force which tends to separate the particles from one another, or to expand the whole bulk, but which force grows less and less as the particles are more and more separated, that is, as the bulk increases, the state of rest will always be that in which the elastic force upon a square inch of the surface of air, arising from its own constitution, just balances the external pressure upon that square inch. To illustrate this, suppose a vertical tube, A B C D, open at both ends, *at first*, and filled with air, which communicates with the exterior atmosphere. Place a slight membrane, E F, across it, which can be moved up and down the tube, so that, except for friction, it would be displaced if the pressures of the air above and below it were in the least degree unequal. At present there are two equal and contrary pressures on the two sides of E F, arising from the weight of the column of air above E F. For if the pressure from underneath were less than that from above, E F would move downwards, and *vice versâ*. Now cover the end B D of the tube, so that the air in E F D B shall have no communication with the exterior air. The membrane, E F, still remains at rest; that is, the air E F D B, without being pressed by the exterior atmosphere through the section B D, exerts the same force upon E F from below as the exterior atmosphere does from above. This is what we mean by the *elastic force* of the atmosphere, as distinguished from the weight of the superincumbent column of air. The two being always equal, may easily be confounded; we only wish to impress upon the reader, that this repulsive force of the particles of air, of which we know nothing but its effects, is a counterbalancing force from within, so to speak, to the pressure from without, and is greater or less according to the less or greater nearness of the particles, as we shall proceed to exemplify.



To get a more distinct idea of the superincumbent pressure on E F, suppose the air to be entirely removed from above E F, so that the membrane must be held down in order to prevent the uncounterbalanced force beneath from driving it up, and exhibiting the phenomena of the air-gun. Let a liquid, mercury for example, be poured into the tube, until there is no longer any occasion to hold down E F, or until the weight of the mercury will just counterbalance the pressure of the air from below. In the average state of the atmosphere, this will require about thirty inches of the tube above E F to be filled with mercury. Now let half the mercury be removed, that is, let it only stand fifteen inches above E F. This is not sufficient to counterbalance the pressure from beneath, and the membrane will rise to twice its height above B D, that is, the air will now occupy twice the space which it did before. But this will not happen immediately, for it will settle at first at something less than the height we have mentioned, and attain that height by degrees. The reason would be manifest if a thermometer were placed in the space E F B D; for it would be found that the thermometer would fall when the expansion began, and would gradually regain its original height as the membrane acquired its full distance from B D. Similarly, if the quantity of mercury were doubled and made to stand at sixty inches above E F, the pressure on E F would be greater than that from beneath; the membrane would descend, the thermometer *rising* at the same time; and by the time the thermometer again indicated the same temperature as at first, the membrane E F would stand at half its original distance from B D. If any other quantities of mercury were added or taken away, similar results would be found, so soon as the alteration of temperature was balanced by the surrounding atmosphere, which, in the first case, imparts heat to the apparatus, and, in the second, receives heat from it. Thus, if only one-third of the mercury were left, the air would overbalance it until it had expanded into three times its dimensions. If the mercury were increased five-fold, the air would never furnish a counterpoise until it was reduced to one-fifth of its former dimensions. This remarkable law, which holds for all gases as well as air, may be expressed as follows: *at the same temperature*, the elastic forces of two portions of air (or, which is the same thing, the weights of mercury they will balance) are in direct proportion to the densities, or in inverse proportion to the spaces occupied by these portions. In the apparatus above described, we do not pretend to show a good practical method of actually performing the experiment. For this purpose we must refer to AIR-PUMP.

The very great pressure of the atmosphere is illustrated by the following experiment. Two hollow hemispheres are loosely placed one upon the other as in the figure: the lower communicates by a tube, in which is a stop-cock, (open for the present,) with the exhausting apparatus of an air-pump. At present there is no impediment to lifting the upper from the lower except its weight; the pressure of the air from within counterbalancing that from without. But if the air be withdrawn from the interior, and the stop-cock closed so that the apparatus can be unscrewed from the air-pump without allowing the air to enter, it will require an enormous force to separate the two hemispheres. If the diameter of the circle be fourteen inches, the least force that will separate them will be equivalent to about half a ton. Such being the external pressure, it may appear extraordinary that the human body is capable of supporting it without being crushed to atoms. The pressure on the body is computed at several tons. But the cause of wonder is purely imaginary. In the words of Dr. Robison, 'the human body is a bundle of solids, filled or mixed with fluids, and there are few or no parts of it which are empty. All communicate either by vessels or pores; and the whole surface is a *sieve*, through which the insensible perspiration is performed. The whole extended surface of the lungs is open to the pressure of the atmosphere; everything is therefore in equilibrio; and if free or speedy access be given to every part, the body will not be damaged by the pressure, however great, any more than a wet sponge would be deranged by pressing it any depth in water.' (*Mechanical Philosophy*, vol. iii. p. 541.)

The temperature of air, as already noticed, influences its elastic force. We have every reason to conclude, that the principal properties of this and all other gases are a consequence of the presence of heat, though we do not know what the latter is. It is probable that air would become, first liquid, and then solid, if it could be made sufficiently cold. Like all other substances, air gives out heat when it is compressed, that is, raises the temperature of surrounding bodies, and *vice versâ*. This is strikingly illustrated by the fact that tinder can be set on fire when the air in which it is contained is suddenly and violently compressed.

From careful experiments it appears, that air and all other gases, as well as vapours, and also all mixtures of gases and vapours, obtain an increase of elastic force for every increase of temperature, and expand, therefore, if expansion be possible, in the vessel which contains them. The quantity of this expansion, when the temperature passes from the freezing to the boiling point of water, (that is, from 32° to 212° of Fahrenheit's, from 0° to 80° of Reaumur's, and from 0° to 100° of the Centigrade, thermometers,) is 375 parts out of a thousand of the bulk which it had at the freezing point. That is, in the apparatus of the preceding part of this article, form a graduated scale along B A, and suppose that B E contains a thousand parts, and that, the upper air being removed, as much mercury is poured in above E F as will cause the membrane E F to stand at E, when the temperature of the air is at the freezing point of water. Then, if the air be gradually heated from the freezing to the boiling point of water, either more mercury must be poured in, or the membrane with the superincumbent mercury will rise through 375 divisions more of the scale, and E will stand at 1375. And this dilatation is uniform: that is, whatever expansion arises from an increase of 12° of temperature, half as much arises from an increase of 6°, twice as much from one of 24°, and so on. This remarkable law, which holds, with perhaps a slight variation, at very high and very low temperatures, was discovered nearly at the same time by Dalton in England, and Gay-Lussac in France. Now, in Fahrenheit's thermometer there are 212°—32°, or 180° between the boiling and freezing points of water; 80° in Reaumur's, and 100 in the Centigrade. Consequently the whole increase of bulk, or $\frac{375}{1000}$, will give $\frac{375}{180000}$, $\frac{375}{80000}$, and $\frac{375}{100000}$, for the variations of bulk corresponding to a rise of one degree of temperature on each of the three thermometers; that is, $\frac{1}{480}$, $\frac{3}{640}$, and $\frac{3}{800}$, respectively. But in applying these rules, it must be recollected, that, taking Fahrenheit's thermometer, for example, the expansion is $\frac{1}{480}$ of the *bulk which it had at the freezing point.* Suppose, for instance, we have a bulk of air which occupies 1000 cubic inches at the temperature of 62° Fahrenheit, and we wish to know how much it would occupy under the same pressure at 82° of the same. The first temperature is 30° above the freezing point, so that the 1000 cubic inches are composed of—firstly, the bulk at the freezing point, secondly, $\frac{30}{480}$ or $\frac{1}{16}$ of that bulk due to the additional 30° of temperature. Therefore, the 1000 cubic inches are $1\frac{1}{16}$ or $\frac{17}{16}$ of the bulk at the freezing point, which latter must, therefore, be $\frac{16}{17}$ of 1000 cubic inches, or $\frac{16000}{17}$. It is $\frac{1}{480}$ of this which is added for every degree between 62° and 82° or $\frac{20}{480}$, that is $\frac{1}{24}$, for the whole 20°. Now $\frac{1}{24}$ of $\frac{16000}{17}$ is $39\frac{11}{51}$ cubic inches, whence $1039\frac{11}{51}$ cubic inches is the bulk at 82°.

This law *appears* not to be quite exact at very high or very low temperatures. We subjoin the results of the experiments of MM. Dulong and Petit upon the relative expansions of air and mercury. [Pouillet, *Elémens de Physique*, first edition, vol. i. part i. p. 259.]

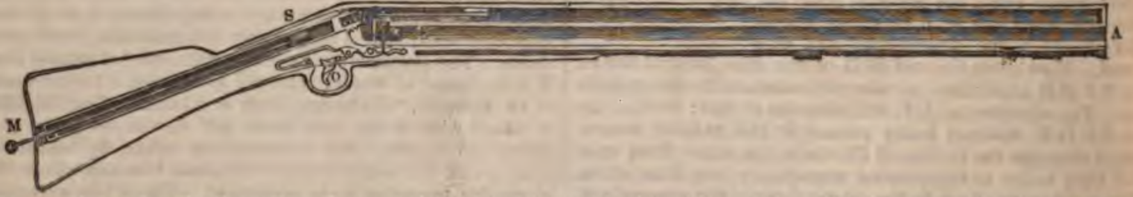
Temperatures by Centigrade Thermometer.		
Mercurial.	Air Therm. corrected for the dilatation of the glass.	Relative bulks of the same mass of air,
—36°	—36°	8650
0	0	10,000
100 Boiling point of water.	100	13,750
150	148·70	15,576
200	197·05	17,389
250	245·05	19,189
300	292·70	20,976
360 Boiling point of mercury.	350·00	23,125

From the first two columns of which we see that the dilatations of air and mercury are not exactly in the same proportion at high temperatures. The third column is derived from the first two, thus: if, in passing through 100° on the air thermometer, the bulk 10,000 increased to 13,750, what accession of bulk will arise from supposing a further accession of 48·70 degrees? We see that when the mercury is dilated so as to increase half as much as it increased from the freezing to the boiling point of water, (from 100° to 150°,) the air does not gain quite so much (from 100° to 148°·70). That is, either the mercury expands more, or the air less, above the boiling point of water, than below. Certain theoretical considerations, into which we cannot here enter, make it highly probable that it is the mercury which takes a greater rate of expansion, and that the law above stated is rigorously true for air and gases at all temperatures.

On the properties of air with regard to other bodies, we may notice that probably there is a slight adhesion of air to many, if not to all, surfaces. A small needle may be made to swim on water, and in this state the water evidently retires from around it, leaving it, as it were, suspended over a hollow in the fluid. This is attributed to the adhesion of a coat of air, which, with the iron, makes the whole specifically lighter than the water. Recent experiments on the pendulum, the most delicate of all philosophical instruments, have led some to suspect, that in addition to the resistance of the air, a slight coating of this substance travels with the pendulum, and thereby causes an irregular addition to its weight. [See PENDULUM.]

In this article we have considered only the chemical and mechanical properties of air. The constitution of the whole mass will come under the article ATMOSPHERE. To complete the subject, refer to OXYGEN, RESPIRATION, COMBUSTION, VENTILATION, ACOUSTICS, AERODYNAMICS, and also to Turner's *Chemistry*, fourth edition, p. 231; Biot, *Précis de Physique*, 207; and the various articles on the subject in the *Encyclopædia Metropolitana.*

AIR-GUN. An instrument for projecting bullets, in which the moving power is the rush of condensed air allowed to escape, instead of the formation of gases arising from the ignition of gunpowder. The air-gun and the common gun are therefore the same in principle, and it is only necessary to describe the peculiarities of its mechanism.



We have given above the section of one of the earlier species of air guns.

In the stock of the gun is a condensing syringe, the piston of which is M S, by means of which air is condensed into the cavity C S, which has a valve opening inwards, just behind the bullet K. The barrel, K A, is open, and the bullet (which should just fit the barrel) is inserted in the usual way. The trigger, O, opens the valve behind the bullet, and permits the rush of the condensed air, which propels the bullet forward. The moment the finger is withdrawn from the trigger, the air closes the valve, and remains, somewhat less condensed than before, for the next discharge.

The same principle has been variously applied. In the magazine air-gun, there is a reservoir of bullets, in a channel under the barrel, one of which is turned in by a cylindrical cock pierced by a tube, which in one position is a continuation of the reservoir of bullets, and in another, of the barrel. Thus by turning the gun upside down and turning the cock, a bullet falls into it from the reservoir, which, on returning the cock, is of course in the barrel. In some air-guns, the cavity containing the condensed air is a hollow copper ball, which can be screwed on to the gun after condensation. The *air-cane* is so called because it is usually in the form of a walking-stick. The handle contains the condensed air, and can be unscrewed and filled by a separate condensing syringe. There is some mention of an instrument similar in principle to the air-gun among the ancients; and it is said that Ctesibius, a celebrated mechanical philosopher, who lived, B.C. 120, at Alexandria, constructed an instrument, in which the air, by its elastic force, discharged an arrow from a tube. (Montucla, *Histoire des Mathématiques*, vol. i. p. 267.) The invention, such as we have described it, is ascribed to Marin, a native of Lisieux, in France, who is said to have presented an air-gun to Henry IV.

No power, but only a convenient adaptation of power, is gained in an air-gun, since the condensation of the air requires force. If the arm which condenses the air into the cavity could, without exertion, follow the bullet, and employ its force only in pushing the latter onwards, it would communicate the velocity which the bullet would receive from the gun, before as much force had been expended as would be required for the condensation; for the whole force employed in overcoming the friction of the piston would be saved. This consideration will be more fully discussed in the article MACHINE.

The elastic force of the gas produced from gunpowder is stated by Dr. Hutton to be about 1000 times that of common air, at the moment when it is produced. And the velocities which are produced by different forces are not as the forces themselves, but as the square roots of the forces. Attending to this consideration only, a compression of forty *atmospheres*, as it is called,—that is, a condensation of forty equal bulks of air into one,—would give a velocity bearing to that of gunpowder the proportion of the square root of 40 to that of 1000, or one-fifth. But there is another circumstance to be attended to. The gas generated from gunpowder quickly expands itself into many times its first dimensions, thereby diminishing its elastic force in the same proportion; whereas, if the cavity be large, the expansion of the air in the cavity, when it has also filled the barrel, will not materially alter its elastic force. Attending to this, we find, by a rough calculation, that, from the preceding supposition, we might expect to have more than half the velocity of gunpowder. The air-gun has never been used in war, on account of its expense, and the force which must be exerted to condense the air. The latter objection has disappeared since the use of steam: a few very small and portable engines kept constantly at work would provide ammunition for a large army. For great guns, the use of condensed air has never, to our knowledge, been attempted: in fact, the air-gun itself has always been considered as a toy, unless in a very few cases, where it has been the instrument of private and cowardly revenge.

AIR-PUMP. A philosophical instrument for removing the air out of a vessel. We shall also include under this head the apparatus for forcing more air into a vessel, better known by the name of the Condensing Syringe, as the two differ very slightly in their main principle and simplest construction.

fig. 1.

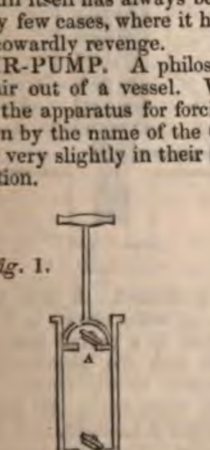
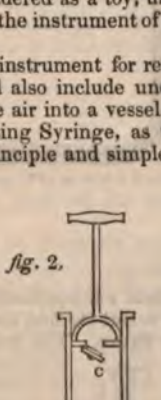


fig. 2.



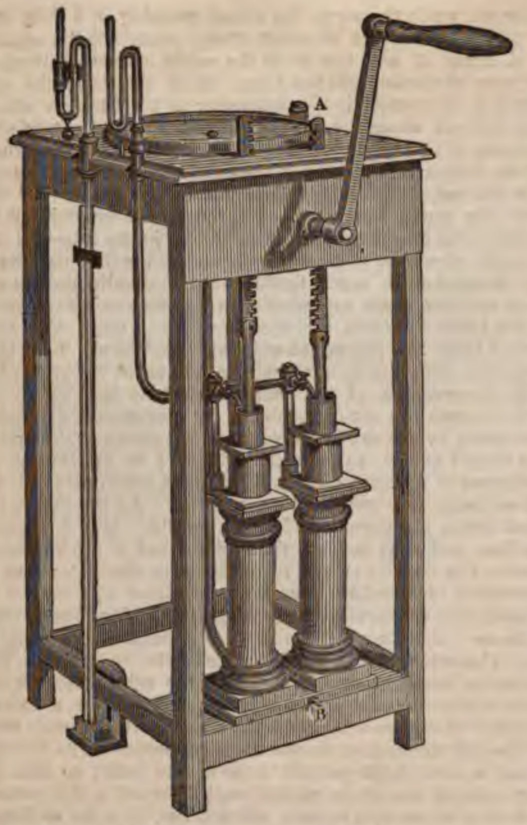
Above we have the sections of the simplest forms of an *exhausting* and of a *condensing* syringe. Both consist of a tube closed at one end, excepting an orifice to which a valve or lid is attached. A piston, with a rod and handle, enters at the other end, and can be moved up and down the tube. The piston is not entirely closed, but has a valve opening the same way as the other valve. Both are attached to vessels, the air of which is to be rarefied or condensed. In fig. 1, or the exhausting syringe, both valves open upwards; or let air only *out* of the vessel and the piston: in fig. 2, or the condensing syringe, both open downwards, or let air only *into* the vessel and the piston.

Let the whole content of each vessel be, for example, six times that of the tube of the syringe, and let both pistons be pushed down. We first take the exhausting syringe. The instant the piston begins to rise, there is no air between A and B, the valve A is kept shut by the pressure of the exterior air, while the air in the vessel, pressing on B from underneath at the rate of about fifteen pounds to the square inch, raises it, and the air in the vessel is thus distributed between the vessel and the tube. If we call the tube one *measure*, the vessel is six *measures*; so that the air which occupied six measures now occupies seven, or is only six-sevenths of its former density. When the piston is returned again, the air in the tube is compressed, but cannot return into the vessel, because B does not open inwards. By the time the piston has returned through one-seventh of its descent, the equilibrium between the air in the tube and the external air will be re-established; and by the time the piston has descended so much farther that the additional elastic force acquired from compression will suffice to lift the valve A, the latter will open, and the air will rush out. This continues until the piston has quite returned to B. That is to say, after every stroke of the piston, the air in the vessel has only six-sevenths of the density which it had before the stroke, since the air contained in six measures is expanded into seven by the rise of the piston. Therefore at the end of the second stroke, the density is $\frac{6}{7}$ of $\frac{6}{7}$ or $\frac{36}{49}$, that is, 36 measures of common air would weigh as much as 49 of the air we have now got inside the vessel. At the end of the third stroke the density is $\frac{6}{7}$ of $\frac{36}{49}$, or $\frac{216}{343}$. Without going farther, suffice it to say, that at the end of the twentieth stroke, the density of the rarefied air is about $\frac{1}{22}$; and at the end of 100 strokes, it would take about five million of measures of the rarefied air to weigh as much as one of common air. But long before this time a limit would be put to the exhaustion, in the present state of the apparatus. The air in the vessel cannot escape into the tube unless it has force sufficient to lift up the valve B; which after a certain number of strokes will not be the case, for the elastic force of the air diminishes in the same proportion as its density, being at first fifteen pounds to the square inch; so that by the time the density is reduced to $\frac{1}{480}$, the valve, if it present a surface of one square inch, will not rise, if it be so heavy as half an ounce. Let us, then, suppose B to be fastened to the piston by a loose string, so long that it becomes tightened just before the piston reaches its greatest height. The string will then open the valve, and the rarefaction will take place as usual.

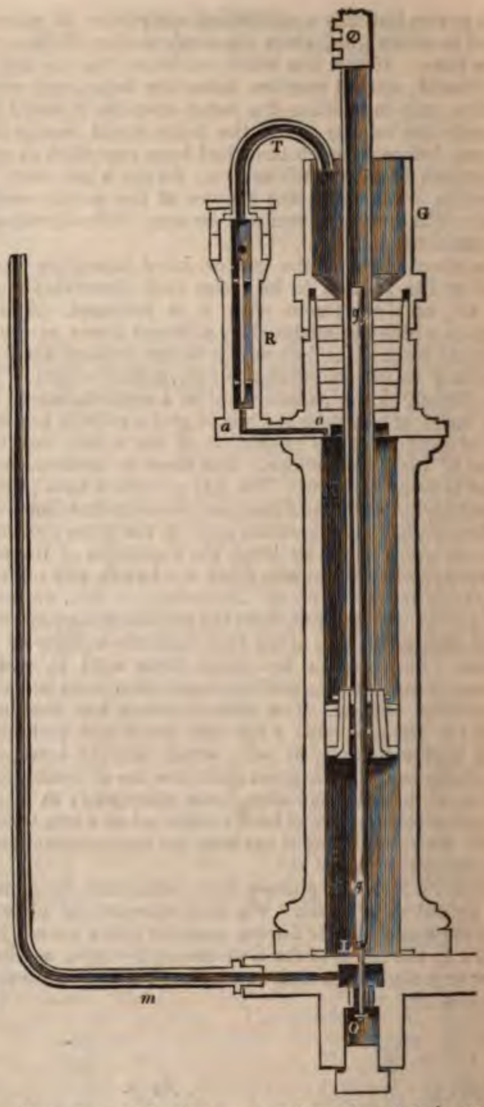
The condensing instrument will now be easily understood. Let the piston be raised, the valves will then be open; but the moment the piston begins to descend, the rush of air outwards will shut C, and the whole of the air in the tube will be forced into the vessel, which admits it, since D opens inwards. If this be done quickly, so that hardly any air escapes, seven measures of air, after the stroke, will occupy the space filled by six measures before it, so that the density of the air in the vessel will be $\frac{7}{6}$; or six measures of condensed air will weigh as much as seven of common air. When the piston returns, air rushes in through C, and presses the valve D, which nevertheless, unless made too heavy, does not open, because it is pressed with a greater force from within. In every succeeding stroke an additional measure of common air is added to the stock already contained in the vessel. At the end of the second stroke the density is $\frac{8}{6}$; at the end of the third $\frac{9}{6}$, and so on. Every succeeding stroke will be more difficult; for the air contained between C and D in the descent of the piston, will not force D open, until it is more compressed than the air within the vessel. Also the condensation increases only in arithmetical progression, while the corresponding rarefaction in the exhausting syringe takes place in geometrical progression. It would take 30,000,000 of strokes, all but one, to produce a condensation, the corresponding rarefaction to which is gained in a hundred. It is needless to say that no materials we could put together would bear such a pressure, and no force we could exert would create it.

The exhausting syringe we have described, is, in principle, the common air-pump. We shall now proceed to describe Cuthbertson's air-pump, containing the most recent material improvements.

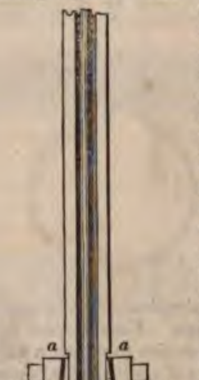
The circular plate at the top is metal ground to a perfect plane surface, on which is placed an inverted glass jar, from which the air is to be exhausted, called the receiver, the bottom of which is also carefully ground: so that if the plate be slightly smeared with grease and the receiver placed upon it, the junction of the two is air-tight. The hole in the middle of the plate is the end of a tube, which extends vertically downwards until, curving at the bottom, it passes through the front beam below the barrels, with the interior



of each of which it communicates. These barrels are exhausting syringes, the construction of which will presently be more particularly described: they are worked by rack-work, communicating with a cog-wheel and handles, space for the racks to play being cut in the upper wood-work of the apparatus. On the left are the gauges for ascertaining the degree of exhaustion obtained, and at A is a place for a PEAR-GAUGE. See also SYPHON-GAUGE, as we shall here only describe the most common, the barometer-gauge. The box attached to the under beam on the left contains mercury, out of which rises a tube and a graduated scale, as in the barometer. This tube passes through the higher wood-work, and also ends in the orifice which is in the middle of the plate, so that the communication being free, the air in the receiver, and that in the tube above the mercury, are in the same state. Hence as the air is rarefied, the external air will force some mercury up the tube, and the height to which it has risen will shew the degree of rarefaction. For example, suppose that the common barometer being 30 inches high, the *barometer-gauge* of the air-pump stands at 20 inches. If the vacuum were complete, the barometer-gauge would be a common barometer, and would stand at 30 inches: but as it stands only at 20 inches, the pressure of the air in the receiver is equivalent to 10 inches of mercury, or one-third of that of the exterior air. Therefore the density of the air in the receiver is one-third of that of the exterior air, or two-thirds of the air have been removed.



The following cut shews a section of the piston rod, as well as of the barrel. The tube *m* comes from the receiver, and air can be admitted by it into the barrel when the rod *gg* is raised. The rod *gg* passes into the piston-rod (which is hollow) and works stiffly in it, being however unconnected with it except by friction. This rod consists of two parts, above and below L, the latter of which is not thick enough to fill the orifice in which it plays. But when the piston descends, the conical juncture of the thicker and thinner parts is brought upon this orifice, and shuts it close. After this, and during the rest of the descent, the hollow piston-rod slides downwards upon the rod *gg*. As soon as the piston begins to ascend, the rod *gg* is raised with it, owing to the friction, so far as the nut O will let it rise, after which the piston-rod slides up *gg*. We have here the lower valve of the exhausting syringe, shut during the descent of the piston, open during the ascent, and not opened by the force of the air from underneath, so that the functions of the string which we supposed in our first exemplification are performed. A little higher up the barrel we find the piston, as better shown in the adjoining figure. The external part is a partial piston not connected with the piston-rod, but fitting closely to the barrel. The piston-rod, when rising, fits this exactly, renders it air-tight, and causes it also to rise. But when the piston-rod is descending, it will not cause the descent of the exterior, and, as we have called it, partial, piston, until the projecting shoulders *aa* (in the figure) come upon it; and, as these shoulders do not go all the way round, the piston in descending is not air-tight. This apparatus supplies the place of the upper valve, being air-tight in the ascent, but not so in the descent. Looking above the piston, we find that its rod works in metal shoulders, the interval between which is occupied by stiff leathers. The space above the leathers opposite to G is filled with oil, which is communicated slowly to the leathers, and also to the barrel beneath. From the latter, however, it is immediately expelled by the rise of the piston, which forces it, as well as the air in the barrel, through the channel *aa*. The oil and the air then force up the rod in the cavity R, which rod, working in collars, answers the purpose of a valve. The



oil is there lodged until it is collected in sufficient quantity to flow again into the reservoir at T. The air escapes into the exterior atmosphere.

Having shown that we have here an under valve shut during the descent, and open during the ascent; with an upper valve open during the descent and shut during the ascent, we need not repeat the manner in which the rarefaction is produced. We have only further to notice, that a branch from the main tube which enters the receiver is carried through the under wood-work in front, and emerges at B. It is here stopped by a screw; but when the operator desires to restore the air under the receiver, he opens this screw, upon which the communication between the exterior atmosphere and the receiver is restored, and the air rushes in. In the perspective figure, a cross bar, in which the upper parts of the barrels are enclosed to strengthen them in their position, is omitted for clearness.

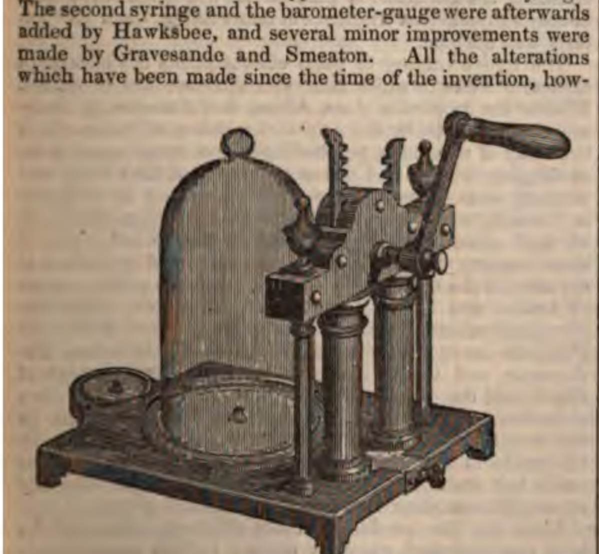
The following experiments are among the most common of those shown with the air-pump:—1. If the receiver be open at both ends, and the upper orifice be stopped by the hand,—on exhaustion, the pressure of the exterior air will prevent the removal of the hand. If a piece of bladder be tied tight over the orifice, as the exhaustion proceeds, the bladder will be pressed inwards, and will finally burst with a loud noise. The pressure of the air is also proved by the experiment of the hemispheres, described in the article AIR.

2. The weight of the air is proved by exhausting a copper ball furnished with a stop-cock, which is shut before the ball is removed from the air-pump. It will then be found to weigh less than before the exhaustion was made.

3. The presence of air in various substances may be detected. A glass of liquid placed under the receiver will give out bubbles of air as soon as the exhaustion begins. A shrivelled apple will be restored to apparent freshness by the expansion of the air which it contains; but will resume its original appearance when the air is allowed to return.

4. The elasticity of air may be shown by placing a bladder under the receiver, not distended, and the mouth of which is tied up. On exhausting the receiver, the air contained in the bladder will expand it more and more, as more of the pressure from the exterior is removed; and the bladder will finally burst from the interior pressure. If a hole be made in the smaller end of an egg, which is placed under the receiver, the small bubble of air, which is always found in the larger end, will, by its expansion, force out the contents of the egg.

The first vacuum was made by Torricelli (see TORRICELLI, BAROMETER), but the first air-pump was constructed by Otto von Guericke, who exhibited it publicly at the Imperial Diet of Ratisbon in 1654. It was an exhausting syringe, attached underneath a spherical glass receiver, and worked somewhat like a common pump. The syringe was entirely immersed in water to render it air-tight. Shortly afterwards, Boyle constructed an air-pump in which the syringe was so far improved that the water could be dispensed with. He also first applied rack work to the syringe. The second syringe and the barometer-gauge were afterwards added by Hawksbee, and several minor improvements were made by Gravesande and Smeaton. All the alterations which have been made since the time of the invention, however important, relate to the mechanism only, and not to the principle on which the pump acts.



We give, in the preceding column, a drawing of a more portable and less expensive species of air-pump, which, after what we have said, will need no description.

The small plate behind the receiver is for another small receiver in which a gauge is placed. This gauge is nothing more than a common barometer, which falls with the diminution of pressure from the air in the receiver, in the same way as the common barometer when the pressure of the exterior air is lessened by a change of weather.

For further details see Hutton's *Mathematical Dictionary*, *Encyclopædia Metropolitana*, article 'Pneumatics.' Lardner's *Cyclopædia*, article 'Pneumatics.' Biot, *Traité de Physique*, i. 127.

AIR, in music, signifies *Melody;* the terms are synonimous; it being understood that by both words is meant succession of single sounds in measured time.

The etymology of this word is very uncertain. The *Della Crusca Dictionary* quotes Redi, who died in 1697, as the first who used the term in a musical sense: but had the compilers of that ponderous work been more diligent in their research, they would have discovered that an eminent writer of their own country, Zarlino, in his *Istitutioni Harmoniche* (*Venetia*, 1589), had employed it more than a century and a half earlier. It is found in Morley's *Introduction* and in Bacon's *Essays*, both of which were published in 1597; and, about the same time, Shakspeare introduced it in his *Tempest*.

The term *air*, as employed in music, is most likely not derived from any word that bears the same meaning, but had its origin, we have ventured to surmise, in a pure metaphor, which owed its birth to the perception of a certain resemblance between elemental air and melody (or musical air) in the qualities of lightness and buoyancy, elemental air occupying the upper part of our sphere, as melody occupies the upper part in music. And here it is necessary to our hypothesis to state, that the term *air* certainly was not applied to musical purposes till long after harmony, or music in parts, was commonly practised, and treated as a most important branch of the art.

Rousseau says that the name of *air* is given to all melodies, to distinguish them from recitative. M. Suard, in the *Encyclopédie Méthodique*, mildly censures this opinion, and, with some hesitation, offers the following definition:—a piece of music, composed of a certain number of melodious phrases, united in a regular symmetrical form, and terminating in the key in which it began. Sulzer has followed M. Suard; so has Pietro Lichtenthal; but, without objecting to his definition, we consider the common and simple one the best,—namely, that succession of single sounds, regulated by the laws of musical rhythm, which constitutes what, in homely language, is called a *tune*. [See RHYTHM.]

Air is, allowedly, the most important of the constituents of music. A composition may be replete with learned and ingenious harmony, may abound in fugue, in imitation, and all the contrivances of science, but without good melody will never appeal to the heart, and seldom afford any gratification to the ear. Haydn carried this opinion so far as to say, 'Let your air be good, and your composition, whatever it may be, will possess beauty, and must certainly please.' Air is in music what design and outline are in the sister art of painting: harmony is the filling up, and the colouring. (See Marcello's *Preface to his Psalms*, quoted in an article on Ancient Greek Music, in No. V. of the *Philological Museum*.)

The Greeks had many kinds of airs, which they called *nomes*, or songs; and we learn from the work of Philodemus on Music, recovered from the ruins of Herculaneum, that every trade and occupation had its Νομοι, or appropriate airs, which were played or sung to the workmen while they laboured.

The various kinds of airs, instrumental as well as vocal, will be found under their different heads. [See ALLEMAND, BARCAROLLE, &c.] In music composed for the theatre, and which is constantly introduced into the concert-room, are the following varieties of air, designated by Italian denominations, viz.—

1. The *Aria di Carattere* (*characteristic air*), which is distinguished by force and energy of expression, and by dramatic effect.

2. The *Aria Parlante* (*speaking air*), which is rather declaimed than sung, and is best suited to the *buffo*, or comic performer.

3. The *Aria di Cantabile* (*singing air*), a tender, pathetic air, calling forth the expression and taste of the singer.

4. The *Aria di Bravura* (literally, *air of courage*, or a *dashing* air), an air in which the performer displays his powers of execution, and seeks rather to astonish than please.

AIR-BLADDER, in ichthyology, a peculiar organ with which the great majority of fishes are provided, and by which they are enabled to adapt the specific gravity of their bodies to the various pressures of the superincumbent water at different depths. Generally speaking, the specific gravity of the muscles, cartilages, &c., or, if we may be permitted to use the expression, of the flesh, of fishes, differs in no sensible degree from that of the element in which they reside; but it will be observed, that this specific gravity cannot be altered at the option of the animal: hence arises the necessity of some peculiar contrivance to enable the individual to adapt itself to the varied and rapid change of circumstances, to which fishes, above all other animals, are particularly subject. This important object is accomplished by means of the organ usually called the air-bladder, because it serves as a receptacle for a certain quantity of air, by the increase or decrease of which the alteration in the animal's weight, compared with that of the surrounding fluid, is accomplished. The vessel itself is composed of a lengthened sack, sometimes simple, as in the common perch, sometimes divided into two or more compartments, by a lateral or transverse ligature, as in the trout and salmon, and, at other times, furnished with appendices, more or less numerous according to the particular species. In all cases, it is composed of a thick internal coat of a fibrous texture, and of a very thin external coat; the whole being enveloped in the general covering of the intestines.

The modifications of this organ are infinitely varied in different genera and species of fishes. In the greater number of instances, it has no external opening, and the air with which it is found distended is believed to be produced by the secretion of a certain glandulous organ, with which it is in all these cases provided. In fresh-water fishes, the air-bladder communicates sometimes with the œsophagus, and sometimes with the stomach, by means of a small tube; and it is observable, that in the greater number of these instances, in which it has a direct external communication with the intestines, the secreting glands above-mentioned do not exist; thus giving us strong reason to believe that its functions and uses are not uniformly the same in all the different classes of fishes. A very limited number of species, among others the common eel, have air-bladders, not only opening by an external duct, but likewise provided with secreting glands; and thus occupying an intermediate station between the two larger classes, at least as far as the nature and functions of this organ are concerned.

In general, all fishes which enjoy great powers of locomotion, and have occasion to pass through various degrees of superincumbent pressure in their rapid transitions from the surface to the bottom of the ocean, are provided with this important organ; and so indispensable is it in their economy, that those which, for the sake of experiment, have been deprived of it, have sunk helpless to the bottom, and there remained incapable of moving, or even of maintaining their equilibrium. But to fishes whose habits and organization confine them either to the surface of the water or to the bottom of the sea, and which, therefore, do not require to pass through different depths, or to encounter different degrees of pressure, the possession of an air-bladder is by no means so essentially requisite. Accordingly we find, that all the different species of rays and pleuronectes or flat fish, such as skates, soles, turbots, brills, &c., which live only upon the coasts and sand-banks at the bottom of the ocean, as well as the mackerel and others which find their food entirely at the surface, have no air-bladder; and so small is the relation of this otherwise important organ to the general conformation of fishes, that we sometimes find it present in one species, and wanting altogether in another of the same genus.

Some zoologists have supposed, that the air-bladder may be connected with the respiration of fishes, and have adduced facts in support of this opinion, which certainly render it extremely probable. At present, however, nothing certain is known upon the subject. Fishermen are well acquainted with the nature and functions of the air-bladder, or, as they most commonly call it, the *swim*. They are accustomed to perforate this vessel with a fine needle in cod, and other species which require to be brought fresh to market, sometimes from a very great distance. By this operation, the confined air is allowed to escape, and the fish constrained to remain quiet at the bottom of their well-boats, where they live for a very considerable period. Cod-sounds, which are brought in great quantities from Newfoundland, are nothing more than the salted air-bladders of these fishes. The Iceland fishermen, as well as those of America, prepare isinglass of a very excellent quality from cod-sounds, though they are not acquainted with the method of clarifying it, which the Russians practise in preparing that article from the sound of the sturgeon. [See Isinglass.]

AIR-CELLS, in plants, are cavities in the leaves or stems, or other parts, containing air. In water-plants they have a very definite form, and are built up of little vesicles of cellular tissue, with as much regularity as the walls of a house; they, no doubt, enable the plant to float. Their anatomical structure frequently exhibits one of the most beautiful of microscopic objects. In plants which do not float, their form is less definite; they often appear to be mere lacerations of a mass of cellular substance, and their object is unknown; well-known instances of their presence are the chambers in the pith of the walnut-tree, and the tubular cavities in the stem of the bamboo, and other grasses.

AIR-PLANTS are so called because they possess the power of living for a considerable time if suspended in air without being in contact with any substance from which they can absorb food. It is, however, a mistake to suppose that these plants are naturally suspended freely in the air; and that such a situation is that in which they will thrive; they will only exist in air for a shorter or longer period, according to the species and to other circumstances, but in the end they will perish.

There are two different tribes to which the name of air-plants has been applied; of which one, containing the moss-like *Tillandsia usneoides*, which hangs in festoons from the branches of trees in the hot damp forests of tropical America; and the fragrant *T. xiphioides*, which adorns the balconies of the houses in Buenos Ayres, is called by botanists *Bromeliaceæ;* the other, abounding in species of the most different nature and appearance, is named *Orchideæ*. It is to the latter, almost exclusively, that the gardener has hitherto turned his attention, and that the following remarks apply.

Till within a few years the cultivation of air-plants of the *Orchis* tribe was supposed to be attended with insuperable difficulties; and of the many hundreds of beautiful species that are found in foreign countries, scarcely any were known in Europe, except from drawings, bad descriptions, and imperfect dried specimens. The method of growing them was so entirely unknown, that no one ever expected to preserve a species beyond a few months after its importation. The application of physiological principles has, however, at length overcome all difficulties to so great a degree, that *orchideous* air-plants have become comparatively common in the hot-houses of the lovers of beautiful flowers; and there appears little reason to doubt that in a few years it will be as common to see them suspended in the drawing-rooms of the richer inhabitants of this country as they long have been in the houses of the Chinese; a purpose for which the surpassing beauty and delicious fragrance of many render them particularly well adapted.

The native country of these curious plants is wherever a climate is found in which heat and moisture are in excess. Within the tropics in Asia, Africa, and America, in damp and shady forests, by the side of fountains, within reach of the spray of waterfalls, perched upon the branches of trees, or clinging to rocks and stones by means of their long and writhing roots,—creeping among moss, rearing their flowers in the midst of brakes and other moisture-loving tribes,—in all such situations they are found in abundance. But in those regions where the heat is accompanied by periodical dryness, as the open plains of India, and the sandy deserts of Arabia and Africa, they are almost entirely unknown. The principal stations for them are the woods of Brazil and Peru, the lower mountains of Mexico, the West Indies, Madagascar, and the adjoining islands, the damp jungle of Nipal, and the whole of the Indian Archipelago; in Java alone nearly three hundred species have been discovered. In that country they are described as overrunning the trees by thousands in mountain forests choked up by huge climbers and a rich undergrowth of gigantic grasses, while not a ray of sunlight can enter to dispel the damp and gloom.

Such are the conditions under which air-plants, of the kind now described, naturally thrive; 1. high temperature; 2. diffused light, like that of a shady grove, and not direct solar light; 3. a great degree of dampness; and, 4. a perfect freedom from stagnant water round their roots: for on the trunks of trees or on stones and rocks no water can lodge, and all the moisture they receive must necessarily be in the form of vapour or of falling rain. And it is to circumstances of this nature that the gardener has chiefly to attend. Damp, shade, heat, and good drainage will be his objects; the three former will cause him no trouble, but the latter will require him to alter entirely his usual mode of cultivation. Instead of considering in what kind of soil his air-plants are to be placed, he will endeavour to dispense with soil, and to supply its place with bits of rotten wood, chopped moss in very small quantities, fragments of half-baked pottery, such as garden-pots, and the like.

These are the points which enable modern gardeners to obtain a certain degree of success. But equal at least in importance to all of them is a circumstance of which they are only just beginning to be aware, namely, that air-plants and all other tropical plants require a season of repose and cessation from vigorous growth. If a gardener were to be told that he ought to keep his vines or his peaches growing incessantly without any season of rest, he would consider his adviser either a madman, or an ignorant pretender; and yet he himself commits the same capital error with his hothouse and greenhouse plants. He is incessantly endeavouring to maintain the perpetual spring of the poets, and he wonders that his plants are sickly and barren. This arises from misunderstanding the well-known fact, that there is no winter in hot countries. It is true that in equatorial regions there is neither frost nor snow, and that in many climates there is no cold season—but it does not, therefore, follow that plants have no season of repose. The fact is, that within the tropics, or in those latitudes where frost and snow and periodical cold are unknown, the season of rest is the *dry* season. At this time of the year vegetation is arrested by a parching air and a fervid sun; the current of life in the trees of the forest becomes languid, herbs lose their stems and disappear, leaves drop from the branches, scarcely a blossom can burst through the hard scaly rind that encompasses it, and all nature wears an air of desolation; plants are then in a state of rest analogous to that to which they are subjected by the winters of Europe. But after a season rain begins to fall, at first gently, as if to excite the nascent buds and to prepare them for the rapid development which they are presently to undergo; as it becomes more abundant, the dry and heated ground reeks with the ceaseless showers; the whole country is enveloped in vapour; grass and herbs start up in the fields and clothe them with verdure, leaves burst forth upon the trees, flowers expand—and the air-plants, which had hung during the dry season from the branches like withered, shapeless things, are roused from their slumber, fill themselves with moisture, and rapidly participate in the general force of vegetation.

This it is to which the gardener should attend; it is this which explains the difference between the success of one cultivator and another; and it is to a knowledge of this, taken in conjunction with the circumstances before explained, that we owe the remarkable improvement that has taken place in the mode of cultivating these plants in Great Britain.

For further information upon this subject, see Dr. Lindley's *Observations in the Transactions of the Horticultural Society*, vol. i., New Series, p. 42, and the latter volumes of the *Botanical Register*. [See Orchideæ.]

AIR-VESSELS, in plants, are what botanists call spiral-vessels. It is supposed by some that these are the only parts through which air is conveyed into the vegetable system, and it has been proved that, in some cases at least, the air that they contain consists of a larger proportion of oxygen than atmospheric air. But it is doubtful whether the action of these vessels is more than local, and it is certain that air has tolerably free access to many parts, as the leaves, for example, by means entirely independent of the spiral vessels. [See Tissue of Plants.]

AIRE, a river which rises on the north side of Malham, a village in the parish of Kirkby in the West Riding of Yorkshire, and about six miles east of Settle. The source of this river is a sheet of water about a mile in circumference, called Malham Tarn. From this basin the stream rushes in a torrent down a highly picturesque rocky chasm, and falls through a distance of 150 feet to the valley of Aire dale. Flowing then in a south-east direction for about thirty miles, it passes through Leeds, where it becomes navigable; and twelve miles farther on, at Castleford, a village three miles north-west of Pontefract, it forms a junction with the river Calder. The united stream holds then an easterly course to the immediate vicinity of the market-town of Snaith, when it runs nearly north-east for five miles to its confluence with the river Ouse, a little below the village of Armin. Thus augmented, the stream then takes the name of the Humber, and flows past the town of Kingston-upon Hull into the German Ocean.

AIRE AND CALDER NAVIGATION. [See Calder.]

AIRE, a town in the former province of Artois, and the present department of Pas de Calais (Straits of Calais), stands on the Lys, (which joins the Scheldt at Ghent,) and is about nine or ten miles S. E. of St. Omer, with which it communicates by a canal. It is a neat town and well paved, but situated in a low marshy soil. It is adorned with fountains, which are so many natural jets; the water, on digging to the depth of 150 feet, rises rapidly to the surface. The chief trade of the town is in linens and fustians: it also makes tiles and soap. The population of Aire is about 9000, and its distance from Paris 132 miles N. Aire was the birth-place of Mallebranche. It is in 50° 38′ N. lat., 2° 23′ E. long.

There is another town of the same name in the department of Landes, on the River Adour; but it is now a place of small importance, with a population of above 3500. This place was once the residence of Alaric, king of the Goths; and is the ancient *Vicus Julii*, or *Atures*. It is 468 miles from Paris S.S.W., 43° 43′ N. lat. 14′ W. long.

AISLE, or AILE, (in Architecture,) indirectly from the Latin word *ala*, a wing, through the French *aile*, which has the same signification. In French, this term is applied to the outlying and returning ends of a building, which we distinguish by its English equivalent, *wing;* such are the columned ends of the front of the Post-Office, and the advanced flanks of the Pimlico palace in London. We apply the term aisle to the lateral divisions or passages of the interior of a church,—those parts which lie between the flank walls and the piers, pillars, or columns, which flank the nave, or grand central division,—when the structure is so arranged. Sometimes, but incorrectly, with reference to modern churches and chapels in this country, the mere passages or corridors which run between, and give access to the pews, are called aisles. Still more incorrectly, some writers, and even ecclesiastical writers, have called all the longitudinal divisions of the body of a church, aisles, thus including the nave under a designation which belongs only to its adjuncts and accessories.

The division of a church into what we term nave and aisles arose simply out of the difficulty which existed of spanning a great breadth with a roof without some intermediate support; and thus the greater Constantinian churches or basilicas of Rome were built with four rows of columns, forming five longitudinal divisions; that is, with two aisles on each side of the nave. This was imitated in subsequent structures, and the metropolitan churches of Milan and Paris were built in five divisions, or with four aisles, as they exist at the present time. That the custom of arranging the interiors of churches with aisles, continued long after the necessity for using the props which form them ceased, may be rendered clear by reference to the following fact. Most of our cathedrals and greater churches in this country are of later date than the roof of Westminster Hall, which, without intermediate support, spans a greater breadth than most of them can boast of; and yet they are, as a general rule, all divided into nave and aisles.

In some English books, though perhaps in none of the present century, this term will be found written without the a—*isle*.

AISNE, in France, one of the many streams whose waters ultimately swell the current of the Seine. It rises just to the west of a chain of hills which form the western boundary of the basin of the Meuse; and, after a course of above 150 miles, first to the north by west, and then to the west by south, joins the Oise, just above Compiègne. It flows past St. Menehould, Vouziers, Rethel, (just below which it becomes navigable,) and Soissons. The chief commodities floated down it are wood for fuel, and timber. It has been attempted, but in vain, to unite the Aisne to the Meuse by a canal. This river gives name to a department which lies between those of Ardennes and Marne on the east, and of Somme and Oise on the west; and is bounded on the south by that of Seine and Marne, and on the north (except where it touches the frontier) by that of Nord. It contains 2196 square miles, and had in 1826 a population of about 490,000 persons. It sends six deputies, and is subdivided into five arrondissements. It includes portions of the ancient Picardy, Isle of France, and Champagne; and is traversed by the Oise in the north, the Aisne in the centre, and the Marne in the south. Various tributaries of these streams water it, and the Sambre, the Somme, and the Escaut (Schelde) also rise in this department. The surface generally consists of undulating plains; there are no hills more than 500 or 600 feet above the level of the sea. The most fertile parts are the high table lands. Chalk in the south, rock suitable for millstone, building stone, slates and turf, &c. are found in this department. The quantity of forest land is considerable, and the oil of the beech mast brings in, in some years, as much as 20,000*l.* The agricultural produce of the department is abundant. The inhabitants export two-thirds of their harvest; and more oxen, horses, and sheep, compared with the extent of the district, are reared than in most other departments. Excellent cheese is sent to different parts of France. The vine is not cultivated to any great extent.

Among the manufactures are that of glass at Nouvion-en-Thiérache, Folembray, and St. Gobain (the last of which places is known for its mirrors); cotton, at Guise on the Oise (population 3500); and linens, cottons, shawls in imitation of Cachemire, soap, and vitriolic acid, at St. Quentin. The capital is Laon (see Laon), near the centre of the department, with a population of above 7000; it also contains St. Quentin on the Somme (population 17,600); Soissons on the Aisne (population 7500)—(see the articles upon those towns);—Château Thierry on the Marne (population 4300); and Vervins, about twenty miles N.E. of Laon (population 2700); all which are sub-prefectures. To these may be added La Fère (population 2500), a fortress on the Oise; and La Ferte Milon (population 2300), the birthplace of Racine, on the Ourcq.

AIX, a considerable town of France, in the department of the Bouches du Rhone, (mouths of the Rhone,) situated just to the north of the River Arc, in a plain surrounded with hills which produce good oil, wine, and fruit. The town owes its origin and its name to the Romans; for the Proconsul, C. Sextius Calvinus, having defeated the Salluvii, a Gallic tribe, founded a colony here about 120 B.C., and gave it, on account of its medicinal springs, the name of Aquæ Sextiæ (the waters of Sextius)—whence the name of Aix. These springs have been discovered in modern days, and identified by medals and inscriptions dug up: the water is clear, light, and moderately warm, without much taste or smell; and is now in small repute for its virtues. From altars of the god Priapus discovered near, it has been thought the Romans ascribed the efficacy of the springs to his influence. There are now few remains of antiquity at Aix. In the middle ages, this town was the residence of the Counts of Provence.

Aix is a handsome place; the streets are straight and well paved and lighted; and the public buildings handsome. It is surrounded by a wall, but is not fortified, and has eight gates. Among the public buildings may be mentioned the cathedral, a noble structure, which suffered less during the revolution than the other religious edifices, of which there were previously a great number. Among the chief ornaments of the cathedral are the baptistery constructed with the remains of a Roman temple;—and the gate of carved walnut tree, which is a curious specimen of the state of art at the commencement of the sixteenth century. The town-hall, though situated in a narrow street, is built with some taste; and contains a collection of articles of antiquity, and a library which is occasionally open to the public. The clock tower, near the fountain in the market-place, was erected in the middle ages, and is remarkable for machinery which puts in motion some figures when the clock strikes. The '*palais*,' an ancient building, contains several large halls, in one of which the parliaments of Provence formerly met. It occupies one side of the 'Place des Precheurs —a square of 500 feet, planted with elms, and adorned with a jet d'eau in the centre. But the finest public place in the city is the 'Orbitelle,' a *cours* or promenade, planted with avenues of trees, and adorned with fountains.

Aix possessed, previous to the revolution, a university, founded in 1409 by Pope Alexander V.; and has now many institutions for the promotion of learning, which, with its valuable libraries and collections of the objects of art or science, public or private, render it an eligible place of study, and have obtained for it the title of the 'Athens' of the south of France. It possesses an academy and schools of theology and law. The public library, one of the richest in France, contains 80,000 volumes. Amongst the charitable institutions are three well-conducted hospitals, those of La Trinité, La Charite, and Hôtel Dieu, the last for lunatics. It is the seat of an archbishopric, of a cour royale, and of some other public boards. The procession of the Fête Dieu, one of the relics of the religious ceremonies of the middle ages, is still kept up; though the friends of religion did little service in reviving it after its abolition at the revolution. It is a singular masquerade, in which the clergy and the municipal officers take part.

The population of Aix amounts to 23,000—or, according to other accounts, 27,000—persons, who carry on a considerable trade in hardwares, fish, and the productions of the neighbouring country, such as wool, silk, wine, brandy, almonds and other fruits, and oil. This last is much esteemed, but the trade has been decaying since the destruction of many olive trees in 1788. Among the manufactures are silks, velvets, woollen cloth, and printed calicoes. Its industry and commerce have much increased within the present century.

Aix is in 43° 32′ N. lat., and 5° 27′ E. long., of Greenwich. It is 478 miles S.S.E. of Paris, and 19 N. of Marseilles.

AIX, a small town of Savoy, with upwards of 2000 inhabitants. It is a place of great antiquity, as is proved by the Roman remains that have been found there, but owes its present importance to two hot springs, which annually attract a great number of visitors. Their temperature is from 112° to 117° Fahrenheit. In the time of the Romans it was called Aquæ Allobrogum, and Aquæ Gratianæ or Domitianæ, and its inhabitants, according to an ancient inscription, were called Aquenses. The origin of the name is the Celtic term *Ac*, 'water,' which is the same word as the Latin Aquæ. The town stands in a pleasant and healthy valley, on the east side of the Lake Bourget, and at an elevation of 823 English feet above the level of the sea. It is seven miles N. by E. of Chambéry, the capital of Savoy, and was included in the French department of Mont Blanc, in the year 1810.

AIX-LA-CHAPELLE, called by the Germans, Aachen, or Acken, is now the chief city of the district of Aix-la-Chapelle, one of the three divisions of the Prussian province of the Lower Rhine. It stands in 50° 47′ N. lat. 6° 3′ E. long. and 75 miles E. by S. from Brussels, the capital of Belgium. The situation of the city is agreeable: it stands on uneven ground, surrounded by hills of moderate elevation, generally covered with wood. The style of building is on the whole pretty good, and the ramparts, which serve as promenades, add to the convenience and beauty of the place. The city consists of two parts, the inner and outer; and contains seventy-five streets, the handsomest of which is that called the New Street; with three monasteries and eighteen churches. There are many public buildings in the city deserving of notice, either for their antiquity or beauty. The town-house is an old building in the Gothic style, containing the portraits of the plenipotentiaries who made the peace of 1748. The minster, which is said to have been commenced by Charlemagne, contains the tomb of this monarch, a great number of relics, and doors of bronze. The emperors of Germany were once crowned here; and, indeed, as long as the Germanic empire lasted, this city claimed the privilege of being the place of coronation, as it was also the proper residence of the emperors. The number of emperors and kings crowned here varies, according to different accounts, from forty to fifty. The imperial insignia were carried from Aix-la Chapelle to Vienna in 1794. There is a handsome theatre at Aix-la-Chapelle, a public library of 10,000 volumes, a gymnasium, three hospitals, and other charitable foundations.

Aix-la-Chapelle once possessed a much more extensive commerce than it has at present. This decline has been caused both by the change in the political circumstances of the city, and, perhaps, more particularly, by the springing up of other rival seats of industry all around it. It is, how ever, still a considerable place, with 2730 houses, and (1828 36,809 inhabitants. It has manufactures of woollen-cloth, kerseymeres, pins, needles, hats, and Prussian blue; and one establishment for refining sugar. The chief fabrics of Aix-la-Chapelle are, however, woollen-cloths and needles. Its manufactures have been promoted by the coal which is found and worked near the town. The needle manufactory has maintained itself better than any thing else under the changed political circumstances of this city: in 1818, there were eleven establishments. The needles of Aix-la-Chapelle are said by the Germans to be equal to those of England for fineness and polish: the steel wire of which they are made is chiefly brought from Altona. Pin-making, in imitation of the English manufactures, was introduced from Upper Alsace.

The Latin name of Aix-la-Chapelle, is said to be Aquisgranum; and the foundation of the first known town on this spot is most generally assigned to Severus Granius, a commander among the Belgæ, under Hadrian; he is supposed to have founded the town about A.D. 125. The remains found in modern times undoubtedly show that it was known to the Romans. Though the place had probably been at least the occasional residence of the Frank kings before the time of Charlemagne, the political importance of the city certainly does not date earlier than his time. Charlemagne is said to have resided there regularly after 768, whenever he was not engaged in war. He built a palace, a town-house, a part of the present cathedral, and fitted up several baths. In the market-place is a fine spring, and a gilded bronze statue of the great emperor, who did so much to beautify this place of his favourite residence. The fountain has a bronze basin twenty-four feet in circumference.

In 882 the Normans ravaged the city. From 1794 to 1814 it belonged to France, during which time it was the capital of the department of the Roer.

Though reduced in rank from an imperial city, once the first in the empire, Aix-la-Chapelle still maintains some importance, and attracts many visitors to its mineral waters, which have given the place its name. The word *Chapelle*, signifying chapel or church, has reference, it is supposed, to the cathedral which Charlemagne commenced in 773. The hot springs have a temperature of about 143° Fahrenheit, and contain a large portion of sulphur: eight bathing-houses are provided for the accommodation of strangers. That called the Emperor's spring is the strongest impregnated with sulphur, and most used by invalids. These waters, like others of the same kind, are both used for bathing in, and are drunk by invalids. (See Monheim and Reumond, *Analyse des Eaux Sulphureuses d'Aix-la-Chapelle*, 1810.)

About 500 paces E. of Aix-la-Chapelle, on the slope of a steep hill, is the little town of Burtscheid, with near 5000 inhabitants. This has both hot and cold springs without any sulphur in them. The two hot springs have respectively a temperature of 158° and 127° of Fahrenheit's scale. The higher springs send forth such a copious stream of water, that they form a considerable brook called the Warm Brook, which, with the addition of other streams, forms the Worm, a tributary to the Roer; the Roer flows into the Maas. In the neighbourhood, on an eminence, stand the ruins of the old castle of Frankenberg. This town manufactures and polishes needles, and also has fabrics of woollen cloth. See Lower Rhine. [See Cannabich's *Geographie*, Ersch and Gruber, &c.]

Treaty of, 1668. A treaty was concluded at Aix-la-Chapelle between France and Spain, on the 2nd of May, 1668, by which an end was put to a war between those powers, arising out of the following circumstances:—On the death of Philip IV. of Spain, in 1665, Louis XIV. thought proper to make a claim to certain possessions of Spain, comprising the Spanish Netherlands (now Belgium) and Franche Comté, alleging the right of his wife Maria Theresa, notwithstanding her formal renunciation of all claim to those provinces on her marriage. To enforce his demand, he declared war in 1667, and by the spring of 1668 the whole of Franche Comté and much of the south and west of Belgium were in his power.

The preservation of the Spanish Netherlands was considered by Holland essential to her security as a barrier against France; and by her influence an alliance with England and Sweden was formed to induce the Spanish court to listen to terms of accommodation, rather than to provoke further aggression on the part of France. The two powers were soon brought to acquiesce, and Aix-la-Chapelle was the place of a congress, which ended in a treaty. France consented to restore to Spain the whole of Franche Comté, on condition of being allowed to retain her conquests in the Netherlands. A portion of these states, including the towns of Lille, Armentières, and Bergues, has ever since formed part of France; the other provinces were restored to Spain by the treaty of Nimeguen in 1678, when Franche Comté was given to France, in whose possession it still remains.

Treaty of 1748. A congress was opened at Aix-la-Chapelle in March, 1748, between France, England, Holland, Austria, Spain, Sardinia, and Modena, in order to adjust the political interests of those powers, which had suffered from a war arising out of the failure of the male branch of the house of Austria, by the death of Charles VI. in 1740. Five princes had started forth to dispute the succession with Maria Theresa, the daughter of the late emperor. France sided with the elector of Bavaria, the chief claimant, and England aided Maria Theresa.

In the course of the war, the Elector of Bavaria seized upon Upper Austria and Bohemia, and was crowned emperor in 1742, while, in the mean time, Maria Theresa gained possession of Bavaria, and soon after recovered Bohemia. The king of Prussia occupied Silesia, and compelled the queen formally to renounce all right to it. England fought with little success in Europe, but she gained the celebrated battle of Dettingen, and in America took Louisberg and Cape Breton. In India, she lost Madras which the French took. France had great success in the north, but was beaten out of Italy.

All parties at length wished for peace, and each sent a plenipotentiary to Aix-la-Chapelle to treat on the terms. It being found impracticable to accord so many divided interests, France, England, and Holland agreed to sign a separate treaty on the 18th October, and to gain subsequently the assent of the other powers; all of whom, except Spain, came successively into the terms of the treaty.

The provisions of several former treaties were confirmed, stipulating the balance of power in Europe, the independence of Switzerland, the free navigation of the Rhine, the security of the Protestant succession in England, and the disunion of the French and Spanish crowns. All the conquests made by the contracting powers were restored, and the state of affairs in the Indies was to remain as it was before the war.

The terms of this treaty produced much dissatisfaction both in France and England, and the vagueness of the last stipulation gave rise to the seven years' war, which began in 1755.

Congress of 1818.—The occupation of France by foreign troops had continued nearly three years, when the submission of the French to the new political arrangements seemed to warrant the allied sovereigns in delivering the nation from its burden before the expiration of the term of five years, originally provided by the treaty of 30 Nov. 1815. The emperors of Russia and Austria, and the king of Prussia, repaired to Aix-la-Chapelle in September 1818, and the plenipotentiaries of Great Britain and France were sent thither by their respective governments. The Conference was opened in September, and a treaty was signed on the 9th of October, by which it was stipulated that the foreign troops should evacuate France on or before the 30th November following.

In pursuance of this arrangement the cantonments in France broke up on the 17th November, and the territory was free before the end of the month. It was settled by the same treaty (Art. 4), that the sums remaining due by France to the allied powers, amounted to 265 millions of francs; of which 100,000,000 should be liquidated on the evacuation of the territory, and the remainder paid by nine monthly instalments, beginning with the 6th January, 1819.

AJACCIO, the chief town of the island of Corsica, and the capital of this department. It has about 7700 inhabitants. It stands on the western coast of Corsica, on the northern side of the gulf of Ajaccio, and is surrounded by high mountains, which shelter it from the northern and easterly winds. The port is spacious and commodious. The town consists of two broad streets intersecting each other at right angles, and other inferior streets and lanes which are very narrow and dirty. Napoleon Bonaparte was born here the 15th of August, 1769. The register of his baptism is to be seen in the books of the parish. The house in which he was born is one of the best in the town, and forms one side of a little court branching out of the *rue Charles*; it is now inhabited by his maternal relations of the name of Ramolini. Ajaccio is a bishop's see, and has a cathedral. The climate of Ajaccio is extremely mild, owing to the situation of the place being open only to the west and south; there is no winter deserving the name, and the fall of a few flakes of snow is an extremely rare occurrence. The cactus, the myrtle, and the palm tree grow freely in the open country. The summer is very hot, hardly any rain falling for six months; and the climate is considered unhealthy from the beginning of July till the end of September. A fine and fertile plain called Campo di Loro extends from the recess of the gulf between two ranges of high mountains, of which Monte Rotondo and Monte dell' Oro are the highest summits. The former is 9000, and the latter 7000 feet high. Snow is to be seen on them even in summer. The trade of Ajaccio is in oil and wine; and it also carries on a coral fishery about the straits of Bonifacio, and on the north coast of Africa. Ajaccio contains a college, a library of about 12,000 volumes, a botanical garden, and an agricultural society. Ajaccio is sixty miles S.W. of Bastia, 8° 50′ E. long. 41° 55′ N. lat.

AJAN, the name by which an almost unknown tract of the coast of east Africa is designated. It extends from near Magadozo, which is included within the limits of Zanguebar, northwards to Cape Guardafui, a distance roughly estimated at about ten degrees of the equator. But the extent of the coast of Ajan cannot be accurately determined, as the name itself is very indefinite. The southern coast is sandy, barren, and low; but the northern is higher about Cape Delaqua and Cape d'Orfui. Between these two capes there is a deep bay. D'Orfui has 'a bluff point towards the sea, and is backed by lofty and singular-shaped mountains' (Salt). It is in N. lat. 10° 30′, E. long. 51° 12′. Cape Guardafui, the most eastern part of Africa, is also a bold promontory with high mountains in the background; it is in N. lat. 11° 50′, E. long. 51° 22′. No great river is described as entering the sea on the coast of Ajan. The neighbourhood of d'Orfui is inhabited by a tribe of Somaulis. (See Salt's Abyssinia.)

The name Azania occurs in the *Periplus*, and comprehends not only the modern Ajan, but the coast of Zanguebar as far as Quiloa; provided this place be the Rhapta of the Periplus.

Rhapta is the most southern point described on this coast by the author of the *Periplus*, but Ptolemy mentions the promontory of Prasum as lying still farther south than Rhapta. The *Periplus* was certainly not written later than the middle of the second century, and at this period we find the Arabs carrying on a brisk trade with the natives of Azania, and intermarrying with them. This coast was at that time almost entirely under Arab influence; Rhapta traded with Muza (near the present Mocha), and sent ivory, rhinoceros horns, tortoise shell, &c. (See Vincent's *Periplus of the Erythrean Sea;* and the *Periplus*, Hudson's *Min. Geog*. vol. i.)

AJAX. Son of Telamon, and third in direct male descent from Jupiter, was one of the most renowned heroes of the Trojan war. According to Homer and Pindar, he was next in warlike prowess to Achilles. He is said by later poets to have been invulnerable: but as in the case of Achilles, this story is not found in Homer. It is fully told by Pindar, Isth. 6. Hercules going to Ægina to invite Telamon to join him in besieging Troy, found the hero at table. Being offered a cup of wine, to make a libation, he prayed to Jupiter that Telamon, who was then childless, might be gifted with a son, whose body should be as invulnerable as the skin of the Nemean lion, and whose spirit should be of corresponding temper and fortitude. An eagle appeared on the instant, which he accepted as a sign that the prayer was heard, and directed that the child should be named Aias, (the Greek form of the name Ajax), from *Aietos*, the Greek name of an eagle. Returning to Ægina after the birth of the child, Hercules made him invulnerable by wrapping him in the lion's skin, which he always wore. One place, however, (as in the case of Achilles,) remained unprotected, where there was a hole in the skin, through which Hercules slung his quiver. Telamon, being banished from Ægina by his father Æacus, for killing his brother Phocus, retired to the island of Salamis, and was chosen king. During his father's life, Ajax led the forces of Salamis to Troy, in conjunction with the Athenians: unless we admit the story that Pisistratus, in order to strengthen the claims of Athens to the possession of the island, interpolated the line of the second book of the Iliad, (558,) which says that Ajax placed his ships alongside of the Athenians. Of the adventures of Ajax before the Trojan war we can give no account. His chief exploits, recorded in the Iliad, are his duel with Hector, in the 7th book, when the Trojan prince challenged any of the Greek army to single combat; and his obstinate defence of the ships, in the protracted battle described in the 13th, 14th, 15th, 16th, and 17th books. In the funeral games of Patroclus he contended for three prizes; in wrestling with Ulysses, single combat with Diomedes, and throwing the quoit; but without obtaining the prize in any. Blunt in manners, rugged in temper, and somewhat obtuse in intellect, his strength and stubborn courage made him a most valuable soldier, but no favourite; and his confidence in these qualities induced him to despise divine aid, by which he roused the anger of Pallas, the author of his subsequent misfortunes. After Achilles's death, the armour of that hero was to be given as a prize to him who had deserved best of the Greeks. Ajax and Ulysses alone advanced their claims; the former depending on his pre-eminence in arms; the latter, on the services which his inventive genius had rendered: the assembled princes awarded the splendid prize to Ulysses. Ajax was so much mortified at this, that he went mad, and in his fury attacked the herds and flocks of the camp, mistaking them for the Grecian leaders, by whom he thought himself so deeply injured. On recovering his senses, and seeing to what excesses he had been transported, he slew himself; and it was observed by Grecian superstition, that the gifts which Hector and Ajax interchanged after their duel proved fatal to both. Hector gave Ajax a sword, which was the instrument of his death: Ajax gave Hector an embroidered belt, the same with which Achilles bound him to his chariot. The hyacinth is said to have sprung from his blood, as before from that of Hyacinthus: and in the spots which ornament it, fancy traced the letters Ai, Ai, which signify Alas, Alas; and at the same time compose part of the Greek form of Aias. This catastrophe is the subject of that noble tragedy of Sophocles, Ajax the Scourge-bearer, so named because the hero is described as cruelly scourging a ram, which he mistakes for Ulysses, before putting him to death. The rivalry of the chiefs is related at length in the 14th book of Ovid's Metamorphoses. Allusion is also made to it in the xith Odyssey. The circumstances of his death are differently told by other authors; but it is not necessary here to do more than notice the discrepancy, very common in these semi-historical tales. The Greeks honoured him with a splendid funeral, and raised a vast tumulus on the promontory of Rhæteum, corresponding in position with that of Achilles, on the opposite promontory of Sigeum. He left a son named Eurysaces, who succeeded Telamon on the throne of Salamis. It is said that Philæus, son of Eurysaces, resigned the sovereignty to Athens, on condition that he might be admitted as a citizen of that state. Through him, Miltiades was descended from Ajax. The Æacidæ, or descendants of Æacus, were held in high reverence as demigods in Attica. One of the tribes was named Aiantis, after Ajax; who, in conjunction with Telamon, and other heroes of the race, was solemnly invoked to the assistance of the Athenians, before the battle of Salamis; and they were believed to have obeyed the call. See *Herod.* viii. 64, 65.

AJAX. Son of Oileus, another distinguished leader in the Trojan war, remarkable for swiftness of foot, and skill in using the bow and javelin. He fills a less important part in the Iliad than his namesake, though he is distinguished by his defence of the ships in company with Ajax, son of Telamon. His notoriety is chiefly derived from events subsequent to the close of the Iliad. At the sack of Troy he offered violence to Cassandra in the temple of Pallas. Indignant at the profanation, the goddess raised a tempest, which wrecked his vessel on its voyage home, and many others of the Grecian fleet. Ajax escaped to a rock, and might have been preserved, but that he blasphemously defied the gods, and said he would escape in spite of them: whereupon Neptune cleft the rock with his trident, and tumbled him into the sea, where he perished. (Od. iv. 502.) Virgil relates his death differently, Æn. i. 39. Some authors say that the charge of violating Cassandra was a fiction of Agamemnon's, who wished to secure her for himself.

AJEMEER, or **AJMEER**. [See RAJPOOTANAH.]

AKBAR (i.e. *the Great*), the son of the Mogol Emperor Humayun, was born on the 14th of October, 1542, at Amerkote, in the great sandy desert east of the Indus; and, on the death of his father, succeeded him in the government of Delhi, in the fourteenth year of his age, (Feb. 15th, 1556). Feeling diffident on account of his youth and inexperience, he conferred the temporary dignity of *khan* *baba* (*i.e* regent and parent, or protector) on Beiram Khan, a Turkoman, and one of the most distinguished officers of the Mogol court, who had already rendered important services to Humayun against the Afghans. The aid of an experienced minister and military commander was of particular importance for the youthful sovereign, as the empire, about the beginning of his reign, was much disturbed, partly by revolts in the interior, and partly by a long continued contest with an Afghan pretender to the throne, Mohammed Shah Adily. The general of the latter, Hemoo, a Hindu by birth, had taken Agra, and had now actually seated himself on the throne of Delhi, with an army of 100,000 horse around him. So doubtful were the Mogol nobles, in Akbar's army, of the possibility of subduing Hemoo, that they even proposed to quit India entirely, and to remove the seat of government to Kabul. This measure was, however, rejected by Beiram Khan, who insisted on an immediate attack upon Hemoo. The result was, that Hemoo was defeated in a decisive battle near Paniput, (Nov. 5, 1556,) in consequence of which Akbar and Beiram Khan entered Delhi without opposition. The Mogol dynasty was thus re-established mainly through Beiram Khan's courage and presence of mind: but several arbitrary measures pursued by Beiram Khan excited the jealousy of Akbar, and he removed him from office. Beiram Khan quitted the court, and made a revolt in Malwa. Akbar sent an army under Pir Mohammed Khan against him, before whom Beiram Khan retreated to the Panjab, and afterwards into the mountains of Sewalik; where he was at last obliged to surrender, (December, 1560.) Akbar pardoned him, and even assigned him a sum of 50,000 rupees (5000*l.*) annually for his support. Beiram Khan was proceeding on a pilgrimage to Mecca, when he was murdered near Puttun in Guzerat, (January, 1561.)

In 1561, Akbar accomplished, through his general Pir Mohammed Khan, the recovery of Malwa from the hands of its usurper Baz Bahadur. Soon afterwards, Shir Khan, a son of Mohammed Shah Adily, advanced from Bengal with an army of 40,000 Afghans to support his title to the throne of Delhi, but was defeated by a comparatively small army of the Mogols.

In 1564, Akbar had again to quell a rebellion in the interior of his empire, which had been excited in Behar and Jooanpur by the Usbek chiefs, Assuf Khan Herwi, Khan Zeman, and Sekander Khan. Shortly afterwards (1566), Akbar was obliged to proceed with an army to the Panjab, where his own brother, Mohammed Hakim Mirza, had usurped the government; and another disturbance was, at the same time, excited in Guzerat by the sons of Mohammed Sultan Mirza. The Usbeks were vanquished after a desperate conflict (June 6, 1566): Khan Zeman, and many other chiefs, suffered death; and it was not till July, 1567, that the Mogul army returned to Agra. In 1572, Akbar invaded the province of Guzerat, where he met with vigorous opposition from the sons of Mohammed Sultan Mirza, but eventually succeeded in expelling them; and he prevailed on the king of Guzerat, Mozaffir Shah, to reside as a pensioner at Agra. In 1575, Dawud Khan, the ruler of Bengal, excited a war in that direction: he was subdued by Akbar's generals, Raja Todar Mal and Monayyim Khan, and the kingdom of Behar and Bengal became finally annexed to Delhi.

In 1579, Akbar's brother, Mohammed Hakim Mirza, occupied the Panjab a second time; but he was defeated by an army sent by Akbar, and reduced to submission. He died in 1583. In the same year, Akbar caused the fort of Allahabad to be built at the confluence of the Ganges and Jumna. About the same time, Mozaffir Khan fled from Agra to Guzerat, in order to make an attempt to regain his dominion. But he was beaten in a sanguinary battle, near Ahmedabad (Jan. 29, 1584), by Mirza Khan, the son of Beiram Khan, and also failed in several successive attempts undertaken for the same purpose. In 1585, Akbar's presence was required in the Punjab, where the Afghans had cut off all communication between Kabul and India. He appointed Kuwar Khan Singh as governor of Kabul, while he himself held his court at Lahore, in order to restrain the Afghans and the Usbeks, who still fomented disturbances in the northern provinces. In 1590, Akbar's son, Mirza Khan, invaded and conquered Sind. Soon after, Mozaffir Shah, the king of Guzerat, was defeated and taken prisoner; and Murad Mirza went as governor to Guzerat, whence he subsequently proceeded to the Deckan.

In 1595, civil disturbances broke out in Ahmednagar, or Ahmednuggur, in consequence of which the interference of Akbar was requested. His son, Murad Mirza, besieged Ahmednagar; and a negotiation, which was ultimately entered into, secured to Akbar the possession of Berar, while Ahmednagar remained in the hands of its former sovereign, Burhan Nizam Shah the Second. Murad Mirza died in 1599; and some years afterwards, also, another of Akbar's sons, Daniel Mirza. Grief for the loss of the latter accelerated Akbar's own death, which occurred on the 13th of Oct. 1605.

The above sketch of the reign of Akbar is abridged from the account given by Ferishta, (Briggs' *Translation*, vol. ii. p. 182—282,) who quotes as his authority a detailed *Memoir of Akbar's Life and Government*, written by his minister Abul Fazl. Notwithstanding his being almost continually occupied with enemies abroad, and revolutionary movements at home, Akbar found time to cultivate the arts of peace, and devoted his attention, with the utmost anxiety, to whatever appeared calculated to promote the happiness of his empire. The mildness of his character, his strict impartiality to the different classes of his subjects, the magnanimity which he showed to his enemies, and his great personal courage, are mentioned with praise even by the Jesuits who visited India during his reign; and the memory of his many amiable virtues still survives among the Hindu as well as the Mohammedan population of India. He encouraged trade and commerce, reduced taxation, and kept a strict watch over the conduct of the officers of his government. But what still more distinguished him was his spirit of toleration, a virtue seldom possessed by Mohammedan sovereigns, which led him to show the same benevolent attention to the interests of all his subjects, whether they professed his own or the Hindu religion. In his endeavours to advance the prosperity of his empire, Akbar was powerfully assisted by his celebrated vizir Abul Fazl, [see Abul Fazl,] who, besides the memoir of Akbar's reign already referred to, wrote an excellent statistical and political account of the state of the Mogol empire during his administration. This, which is one of the most remarkable works in Oriental literature relative to India, will be noticed in a separate article. [See Ayin-i-Akbari.]

AKENSIDE, (MARK,) a poet of considerable reputation in the last century. He was the son of a butcher at Newcastle-upon-Tyne, and born November 9, 1721. His parents were Presbyterians, and intended to bring him up as a minister of that persuasion. With this view they sent him, in 1739, to the University of Edinburgh: but he soon turned his attention to the study of medicine, and after remaining three years in the Scottish capital, went to Leyden; where he finished his education, and took the degree of M.D. in 1744. It should be mentioned to his honour, that having been assisted, while he was destined for the ministry, from certain funds set apart by the English dissenters for the education of their clergy, he repaid in after-life the money which had been thus bestowed upon him. His principal poetical work, the only one by which he is now much known, the *Pleasures of Imagination*, appeared in 1744. It excited considerable attention, and on the whole was received with great applause. The first place in which he settled, after his return to England, was Northampton; but he found no encouragement to remain there, and soon removed to Hampstead, and thence finally to London. Here he acquired several professional honours, but he never obtained any large share of practice. He received the degree of M.D. by royal mandate, from the University of Cambridge, and thus became qualified to be a fellow of the College of Physicians: he was also elected one of the physicians of St. Thomas's Hospital. He died June 23, 1770, aged forty-nine. His principal medical work is a treatise *On Dysentery*, 1764: he also contributed several papers to the *Philosophical Transactions*, and to the *Medical Transactions*, published by the College of Physicians.

The 'Pleasures of Imagination' is written in blank verse, with much power of versification and splendour of language. The subject and design of it cannot be more briefly given than in the author's language: it is to give a view of the various pleasures founded on the exercise of the imaginative powers, 'so that, whatever our imagination feels from the agreeable appearances of nature, and all the various attainments we meet with, either in poetry, painting, music, or any of the elegant arts, might be deducible from one or other of those principles in the constitution of the human mind, which are here established and explained.' As a philosophical work, the reader is not likely to derive much benefit from it; but its poetical merits are considerable. Dr. Akenside pro posed entirely to rewrite the poem; but death interrupted him when he had only completed the first and second books, with portions of the third and fourth. Both the original and the amended poem are contained in the quarto edition of Akenside's *Poems*, 1772, published by his friend Mr. Dyson. For a fuller account of it, the reader may consult an Essay by Mrs. Barbauld, prefixed to the duodecimo edition of 1795, in which his genius is characterised as lofty and elegant, chaste, classical, and correct, not marked with strong traits of originality, not ardent, nor exuberant.

Of his other poetical works, the principal are the *Hymn to the Naiads*, and two books of *Odes*. Many of these are written on political subjects, in which he took a great interest, and are distinguished by zeal in the cause of liberty. In consequence, he was accused of republicanism, a charge which has often been employed as a topic of abuse, and that with very considerable success. Akenside was well read in the literature and especially in the philosophy of Greece; and he has employed images, drawn from this source, with an unsparing, and rather a pedantic hand. [Kippis's *Biog. Britan.* Barbauld's *Essay.*]

AKERBLAD, (JOHN DAVID,) a late Swedish scholar, who distinguished himself by his researches in Runic, Phœnician, Coptic, and Hieroglyphic literature. He enjoyed in early life an opportunity of travelling over several countries in the East in consequence of being appointed Secretary to the Swedish embassy at Constantinople. While holding this appointment, he made a journey to Jerusalem, in 1792. In 1797 he visited the Troad. Some years after he was appointed Chargé d'Affaires to the King of Sweden in France. He spent his last days in Rome, where he was supported by the bounty of the late Duchess of Devonshire, and other admirers of his talents; he died in that city at an early age, on the 8th of February, 1819. The following are the titles of some of his publications: *Lettre à M. Silvestre de Sacy sur l'Ecriture cursive Copte*, published in the *Magasin Encyclopédique* for 1801. *Inscriptionis Phœniciæ Oxoniensis, nova Interpretatio*, Paris, 1802; thirty-one pages, octavo. *Lettre sur l'Inscription Egyptienne de Rosette, adressée à M. Silvestre de Sacy*, Paris, 1802; seventy pages, octavo. *Notices sur Deux Inscriptions en Caractères Runiques, trouvées à Venise, et sur les Varanges; avec les Remarques de M. d'Ansse de Villoison*, Paris, 1804; fifty-five pages, octavo. *Inscrizione Greca sopra una lamina di Piombo trovato in uno Sepolcro nelle vicinanze d'Atene*, quarto, Roma, 1813. He was preparing a new and enlarged edition of this work at the time of his death. *Lettre sur une Inscription Phénicienne trouvée à Athènes*, Rome, 1817; twenty-three pages, quarto. M. Akerblad is said to have been able to speak as well as read various eastern and European languages. He was a corresponding member of the French National Institute, and a member of several other learned societies.

AKERMANN, AC-KERMAN, or AKEIRMAN, a fortified town in the Russian province of Bessarabia, near the outlet of the Dniester into the Black Sea: 46° 12′ N. lat., and about 30° 22′ E. long.

The town stands on a point of land which projects into the *liman* or gulf of the Dniester, and is defended on the land side by deep ditches, and in the parts bordering on the gulf by a thick wall. The town and port, which is a good one, are commanded by a castle on an eminence. The inhabitants, probably exceeding 13,000 in number, chiefly consist of Greeks, Armenians, and Jews, who carry on some trade. Fish, which is caught in abundance in the gulf of the Dniester, and salt from the salt lakes of the district of Akermann, form the principal articles of commerce. A short time ago, a fair was established here. Akermann contains a handsome Armenian church, with some mosques and Greek churches. The streets are dirty and the town ill-built.

Treaty of, is the convention concluded in September, 1826, between Russia and Turkey. By this treaty, the terms of which may be considered as having been dictated by Russia, Turkey agreed to confirm in all its parts the treaty of Bucharest, (concluded in 1812,) to permit the two principalities of Wallachia and Moldavia to be governed by native boyars, elected by the divan of each, to restore the former privileges of the Servians, and finally, to pay the claims of Russia on account of losses incurred by the Barbary corsairs, and to allow that power the liberty of navigation and commerce in all the states of the Sublime Porte, and especially free passage by the canal of Constantinople. By these conditions the important provinces of Moldavia, Wallachia, and Servia, may be regarded as having been released from all but a nominal dependence on the Porte, and made over to the protection, if not to the sovereignty, of Russia.

ALABA'MA, one of the southern states of the North American Union, bounded on the north by Tennessee, on the east by Georgia, on the south by part of the territory of Florida and the Gulf of Mexico, and on the west by the state of Mississippi. It derives its name from one of the rivers called ALABAMA. The sea-coast of Alabama is very limited when compared with the extent of the state: it commences on the Gulf of Mexico, at a point about midway between the mouths of the Pascagoula and Mobile rivers, and running eastward terminates at the outlet of the Perdido river. The real coast-line, not including the bay of Mobile, is not above fifty miles in length. The thirty-fifth parallel of latitude forms the northern boundary, and American authorities assign 30° 10′ as the southern limit. It lies between the meridians of 85° and 88° 30′ W. of Greenwich. The area is roughly estimated at 52,000 square miles. Its mean length, from north to south, is 336 miles; breadth, from east to west, 194 miles. Alabama originally belonged to the State of Georgia. In 1798, the country, including the present states of Mississippi and Alabama, was formed into a *territory;* and the part of Florida between Pearl and Perdido rivers being taken possession of by the United States in 1812, and annexed to this territory, immigration into it immediately commenced. During the years 1813 and 1814 it was harassed by the attacks of the Indians, who were reduced to submission by General Jackson. In 1817, the west portion of the territory became the 'state of Mississippi,' and the east the 'territory of Alabama,'—which, by an act of Congress, March 3, 1819, was admitted into the Union as a separate State. Since that time the population has rapidly increased, as is shown by the following statement:—

1810	less than	10,000			
1816		29,683			
1818		70,542			
1820		127,901,	including	41,879	slaves.
1827		244,041	„	93,008	„
1830		308,997	„	117,294	„ and

1572 free blacks.

Previous to the census of 1830, when the rate of apportionment was 40,000 (in which number three-fifths of the blacks are counted), Alabama had three representatives in Congress: under the new census, and new rate of apportionment (47,700), she is entitled to five; the representative population being 262,507. She has besides two senators in Congress, the number to which each state is entitled.

Rivers.—The principal rivers of this State are the Alabama, Tombigbee or Tombeckbee, Mobile, Black Warrior, Coosa, Tallapoosa, Tennessee, Chatahooche, Perdido, Cahawba, and Conecuh. The general direction of the great rivers of Alabama, and of the Chatahooche, which forms part of its eastern boundary, is from north to south. We find, accordingly, after leaving the sandy alluvium of the Gulf of Mexico, that the ground rises gradually into the interior as far as 33° N. lat., where it begins to be hilly. The greatest elevation lies still further north, and is formed by the termination of the Appalachian range, which makes in the northern part of the state a circular sweep from east to west, bending somewhat to south. We are not able to state with any precision the elevation of the highest points of these mountains above the level of the sea; some authorities giving 3000 feet, which is probably too much, and others, only 1000. The direction in which the high land is continued westward, as the separating line between the basin of the Tennessee and the head waters of the Tombeckbee is, perhaps, not yet accurately laid down on the maps. Alabama then, as it appears, consists of two distinct physical portions considered with respect to its water system: the northern comprises part of the basin of the Tennessee River, (see TENNESSEE,) and contains a large proportion of very fertile soil. This river makes a great bend between the two points where it is intersected by the 35th degree of lat. The chief river of the state is that called the Mobile river in the lowest part of its course, where it passes the town of Mobile, which is on the west bank of the river, and enters the spacious bay of Mobile. Mobile bay is about thirty miles long, and varies from three to eighteen miles in breadth: the main entrance, which is between Dauphin Island and the western cape of Mobile Point, has sixteen feet water. This bay receives through the Mobile river the drainage of a basin of about 37,120 square miles. The Mobile is formed by the union of the Tombeckbee and the Alabama, which meet about thirty miles, measured in a straight line, nearly due north of Mobile. The Tombeckbee itself consists of a western branch, the Tombeckbee, and an eastern, the Tuscaloosa, or Black Warrior. The Tombeckbee rises in the N.E. angle of the state of Mississippi, in the country of the Chickasaws, (34° 40′ N. lat.,) and after a southern course of 100 miles enters the state of Alabama, (33° 16′ N. lat.,) five miles below Columbus in the state of Mississippi, where it is a navigable river. Steam-boats ascend the Tombeckbee as far as Columbus, and sometimes farther. It is joined by the Tuscaloosa in 32° 31′ N. lat. The Tuscaloosa rises in the N.E. angle of the state, (34° 20′ N. lat.) or rather, perhaps, just within the limits of Georgia, and within ten miles of the channel of the Tennessee river at the great bend in Decatur county, Tennessee. It pursues a general course S.W. for 150 miles, passing Tuscaloosa, the capital, to its junction with the Tombeckbee. There is steam navigation as far as Tuscaloosa. The united stream then pursues a winding course, but in a general direction, about W. of S., for ninety miles, when it is joined by the Alabama, (31° 9′ N. lat.) The Alabama has two main branches; of which, the Coosa rises in the north part of Georgia, (35° 05′ N. lat.,) and enters Alabama near Fort Armstrong; from which point its stream, after making several deviations, unites with the Tallapoosa at a point about W. by S. from Fort Armstrong; the Tallapoosa, which also rises in Georgia (34° N. lat.), and has a general course, something like that of the Coosa, unites with it (at the village of Coosawda 32° 28′ N. lat.) after having made a sudden turn to the west about twenty-five miles long. Fifty miles S.W. from Coosawda the Alabama receives the Cahawba from the north, at the town of Cahawba, and after a S.S.W. and very tortuous course of 200 miles, joins the Tombeckbee about thirty miles above Mobile, as before stated. The direct distance between Cahawba and the junction of the Alabama with the Tombeckbee is not more than 100 miles. The Alabama is navigable for steam-boats most of the year to the falls of the Coosa, about 450 miles from its mouth. Here the rapids commence, and continue at intervals for sixty miles: they are passable for boats during high water. Above these rapids the river is deep, smooth, and perfectly navigable for 200 miles, nearly as far as its source in the valley of the Tennessee River,—a navigable branch of which almost communicates with it. The Alabama, like most of the large American rivers, differs very considerably in its volume of water at different seasons. Below the junction of the two main streams, the Tombeckbee and Alabama, the river does not flow in one channel, but in two main, and numerous smaller channels, for more than thirty miles direct course through a low wet country, to the head of Mobile Bay.

The rivers of Alabama are highest in the spring of the year, and it is not uncommon for them to rise eighty or ninety feet above low water. The banks, when they present a recent surface, exhibit a beautiful appearance, striped with alternate layers of gravel and different-coloured clays. The clays commence about twenty feet above low water. The layers are of different thickness, from one inch to several feet, and of various colours, from red and deep blue to a delicate white. Steam-boats were first introduced on these rivers in 1820.

The Chatahooche rises in the northern part of Georgia, and is part of the boundary line between Alabama and Georgia. It communicates with Flint River to form the Apalachicola, and is navigable for steam-boats to the falls of Columbus, above 300 miles. The Perdido separates Alabama from Florida.

The Tennessee runs through the northern part of this state. It enters Alabama on the east, running south-west; it then runs west-north-west, and again enters the state of Tennessee. It empties into the Ohio, in Kentucky. The part of the state north of the river is called Tennessee Valley, and contains a population of about 70,000. This river is navigable for large steam-boats 250 miles, to Florence in Alabama, which is below the mussel-shoals, where the river spreads out from one to three miles in width, with a rocky bottom, and is so shallow, that boats can neither ascend nor descend, except at high water during floods. A canal is contemplated round these shoals; and the United States have made appropriations of land to the state of Alabama to effect its construction. Above the shoals, steam-boats may ascend the Tennessee and Holston to Knoxville, 700 miles from the mouth of the former.

Pensacola Bay is entirely within the limits of West Florida, but as this territory here only consists of a comparatively narrow slip along the Gulf, the sources and the main body of the streams that enter Pensacola Bay are within the state of Alabama. The main stream that discharges into Escambia Bay (one of the upper bays of Pensacola Bay) is the Escambia; but the chief branch of this river is the Connecuh, though the name of the Escambia prevails in the lowest part of their united course.

The alligator abounds in the Alabama and Tombeckbee rivers.

Soil, Products, &c.—Besides the Alleghany or Appelachian range, there are no other eminences which can be dignified with the name of mountains. In the northern part the country is hilly, with elevations of three or four hundred feet above the valleys: in the middle it is also hilly, with some tracts of open land or prairies. The south part, which borders on the Gulf of Mexico, throughout a space of fifty or sixty miles in extent, is low and level, covered with pine and cypress. The coast of Alabama appears at present to be receiving no increase, but, on the contrary, some diminution from the action of the waves. The forest trees, in the middle and northern divisions, are post, black and white oak, hickory, poplar, cedar, chestnut, pine, mulberry, &c.; the elm flourishes on the river banks. The chief wild animals are the deer, bear, wolf, panther, fox, &c.: the rattle-snake abounds in this state. The soil is various, but the greater part of it is excellent. 'In the south it is generally sandy and barren; and a part of the high lands are unfit for cultivation. A large portion of the country which lies between the Alabama and Tombigbee, of that part watered by the Coosa and Tallapoosa, and of that on the Tennessee, consists of very excellent land. On the margin of the rivers (in the southern part) there is a quantity of cane-bottom land of great fertility, generally from one-half to three-quarters of a mile wide: on the outside of this is a space which is low, wet, and intersected by stagnant water; next to this river-swamp, and elevated ten or fifteen feet above it, succeeds an extensive body of level land, of a black, rich soil, with a growth of hickory, black oak, post oak, poplar, dog-wood, &c. After this come the prairies, which are wide-spreading plains, or gently-waving land, (resting on a soft limestone rock, abounding in shells,) clothed with grass, herbage, and flowers, and exhibiting, in the month of May, the most enchanting scenery.' (*Encyclop. American.*) There is generally wood enough on the prairies to fence them. It is arranged in lines and clumps on the lower and moister portions, dividing them into open spaces of several hundred acres. The soil is of variable depth, and rests on a uniform bed of limestone. In some places the rock juts out on the surface, where it easily decomposes. There is a great deficiency of water, and what there is of it is very bad: good water can be obtained by boring to the depth of three or four hundred feet, and in many cases this water rises to the surface.

The long-moss region commences below 33° lat. The moss hangs in festoons from the trees, giving to the forests the most dark and gloomy aspect. It is much used for making mattresses. Cotton is the staple product, and is raised in great quantities; the land produces from 400 to 1800 pounds of seed cotton to the acre. The annual crop of the state is estimated at 200,000 bales, and is increasing every year; the greater part of it is carried to Mobile—that from the Tennessee valley only being taken to New Orleans. The land is tilled almost entirely by slaves. The men slaves are hired at from 100 to 150 dollars a year. A great deal of Indian corn is raised for domestic consumption, and considerable quantities of oats, but not much wheat. The sugar-cane is beginning to be cultivated in the southern parts. There is a constant tide of immigration to this state, particularly to the southern districts, from Virginia, North and South Carolina, and Georgia. The immigrants are generally planters, bringing with them their slaves to cultivate the land. The price of the best land varies from ten to twenty dollars an acre, but is rapidly rising in value—public land may be entered at one dollar and twenty-five cents per acre. Not more than one-twentieth of the state is yet in cultivation.

Iron ore is found in several places, and fossil coal abounds on the Black Warrior river; marble is found on the Cahawba. Gold also has been found, but not in sufficient quantities to render the business profitable.

Climate.—The mean temperature of the state is about 65° F., or, perhaps, less. Although the summer continues longer, yet the heat is very little greater than in the north part of the United States. The thermometer seldom exceeds 90°. June is the hottest month in the year. The fig and peach arrive at great perfection below 34° lat., and the climate and soil are supposed to be well-adapted to the grape, but not to the olive. The fruit trees blossom between the middle of January and first of March, according to the elevation of the place. Snow neither falls deep nor lies long; a thin sheet of ice sometimes covers the stagnant waters at the coldest period; the rivers are never frozen over. The climate is healthy, except in the bottom land bordering on the rivers. In the elevated country it is delightful, the heat of summer being tempered by the breezes from the gulf of Mexico. The prevailing diseases in low situations are intermittent and bilious fevers. Mobile has been several times ravaged by the yellow fever, but it has not been severe of late years.

Indians.—The *Cherokees* occupy the north-east corner of the state, and extend into Georgia and Tennessee: the *Creeks*, the east, with part of Georgia; and the *Chickasaws* and *Choctaws* the west, extending into Mississippi. The whole number within the state in 1831 was estimated at 19,200, but they are fast emigrating west of the Mississippi, where a large tract of country has been ceded to them by the United States in exchange for their own. The Cherokees, most of whom reside within the limits of Georgia, are the most civilized. They have a written and printed language, the alphabet of which was invented by a native Cherokee; it consists of eighty-five characters, and may be called a *syllabic alphabet.* It is said that an active Cherokee boy may learn to read in a day; and not more than two or three days are ordinarily requisite; he has only to repeat successively the names of the several letters, so that when he has learned his alphabet he can read his language. There are remains of mounds and roads in the state, respecting which the present Indians have no tradition.

Counties and Towns.—In 1820 the state was divided into twenty-four counties; in 1828, thirty-six; and in 1833, ten new counties were made in the Creek, and one in the Chocktaw country. The chief towns are *Tuscaloosa*, the present capital, situated at the falls and head of steam-boat navigation on the Black Warrior river; 33° 12′ N. lat. 87° 42′ W. long., 256 miles N. of Mobile by land, and 400 by water, 160 S.S.W. of Huntsville, 858 S.W. of Washington, and 368 N.N.E. of New Orleans.* Tuscaloosa takes its name from the Chocktaw appellation of the Black Warrior river. The situation of the town is healthy and pleasant, being on an elevated plain of several miles in extent. The university of Alabama is about one mile from the town. Coal is found on the banks of the river, and in the vicinity abundance of materials for building, particularly stone, and pine timber. Population about 2000. *Mobile*, the principal port, is situated at the influx of Mobile river into the bay of the same name; 30° 40′ N. lat. 88° 21′ W. long.; 50 miles by land from Pensacola, 1033 from Washington, and 160 E. from New Orleans. In 1813 it came into the possession of the United States, and then contained about 300 inhabitants; in 1822, 2800; and in 1830, 3194. The back country is dependent on Mobile for a market. The principal exports from Mobile consist of cotton, of which upwards of 100,000 bales are shipped annually to Europe and the north part of the United States. Steam-boats and schooners run regularly to New Orleans, the lakes Pontchartrain and Borgne. *Huntsville*, in the north part of the state, is the next town in importance. It has a considerable trade in cotton with New Orleans, and a communication with the Tennessee river by a canal ten miles in length. Population in 1830, 2000. Montgomery, on the Alabama river, is a flourishing town. Cahawba was the former capital of the state.

Government.—By its constitution, adopted in July, 1819, the legislative power is vested in two branches, a Senate and House of Representatives, which together are styled the *General Assembly of the State of Alabama.* The representatives are elected annually, and are apportioned among the different counties in proportion to the white population; the whole number cannot exceed 100, nor fall short of 60. The senators are elected for three years, and one-third of them are chosen every year; their number cannot be more than one-third, nor less than one-fourth of the number of representatives. At present the Senate consists of twenty-two, the House of Representatives of seventy-two members the pay of the members of both houses is four dollars a-day each. They meet annually at Tuscaloosa on the fourth Monday of November, and remain in session about two months. The executive power is vested in a Governor, who is elected by the people for two years, and is eligible four years out of six; he possesses a qualified negative on legislative acts; and the pardoning power: in cases of treason, the consent of the Senate is necessary. In case of his death, absence, &c. the president of the Senate acts as governor; the salary is 2500 dollars. The qualifications required for members of the legislature are, citizenship, two years' state, and one year's district residence; a senator must be twenty-seven years of age: a governor must be thirty years old, a native citizen, and must have resided four years in the state. A voter must be twenty-one years of age; one year's state and three months' district residence are required. Blacks in all cases are excluded. Two-thirds of the General Assembly may propose amendments to the Constitution, which, if ratified by the people at the next election, and by two-thirds of the subsequent legislature, become valid.

Judiciary.—The state is divided into seven circuits, to which an eighth has been lately added, in each of which there is a circuit-judge; and, until the session of 1831-2, the *Supreme Court* was formed by a union of these seven judges. In that session, however, the legislature established *a separate Supreme Court*, consisting of three judges, who meet at Tuscaloosa twice a year, and remain in session from six to eight weeks each time. The judges are elected by the joint vote of both houses of the General Assembly; the tenure at first was during good behaviour, till seventy years of age. In 1830, the constitution in this respect was altered, and after Nov. 1833, they are to be elected, by the same body, every six years. They are removable by impeachment and by the governor, on the address of two-thirds of the General Assembly—the judge must be heard in defence. Salary of judges of Supreme Court is 1750 dollars; of Circuit Court, 1500 dollars.

There are also such inferior courts as the general assembly may, from time to time, direct and establish. The other public officers are the secretary of state, comptroller of public accounts, state treasurer, and attorney-general; the first three receive a salary of 1000 dollars a year each, and the last 425 dollars, with perquisites.

Laws.—The laws in this state differ but little from those of the other states of the Union. The punishments are fine, imprisonment in the county jail, standing in the pillory, branding, whipping, and death by hanging. The crimes punishable with death are murder, treason, rape, man-stealing, slave-stealing, arson, robbery, burglary, counterfeiting, and forgery. The penitentiary system has not yet been introduced into this state. The consequence of making so many offences capital is that many go unpunished, or are pardoned by the executive. Very severe laws have been passed against *duelling;* killing in a duel is wilful murder, and as such punishable with death; members of the general assembly, officers of government, civil and military, and attorneys at law, are required to take the duelling oath. The legal rate of interest is 8 per cent. If more than that is taken, it is usury, and the lender forfeits the amount, with all interest thereon.

Education.—The constitution declares that 'schools and the means of education shall for ever be encouraged in this state.' By an act of the Congress of the United States, in 1819, one section of land (640 acres) was granted to the inhabitants of each township in the state for the use of *schools;* and seventy-two sections, or two entire townships, for the support of a *seminary of learning*, which were vested in the legislature of said state, to be appropriated solely to the use of such seminary by the said legislature.* In conformity with the above grant, an institution, styled the *University of the State of Alabama*, was incorporated by the legislature of the state in December, 1820. In 1821, two trustees from each judicial circuit were elected by joint vote of both houses. The governor of the state is, *ex officio*, president of the board of trustees. They hold their office for three years. All the university lands were vested in these trustees to be sold at public auction; such as were not sold were to be let on rent. The funds of the university consist of the proceeds of these lands. According to a report of the president of the board of trustees, dated January 14th, 1830, 21,845 acres had been sold for the sum of 304,651 dollars, of which 111,712 had been vested in 6 per cent. stock; and 24,234 acres remained unsold. In the session of 1827-8, the university was located about one mile east of Tuscaloosa, in a fine healthy situation. It opened on the 18th of April, 1831: the average number of students has been about ninety; price of tuition, including room, rent, fuel, &c., 40 dollars for the collegiate year (nearly ten months). Board 80 dollars for the same time.*

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* These land distances we believe are calculated along the road, the direct *on the map* being much less.

* A township contains 23,040 acres, is six English or American miles square, and is subdivided into thirty-six equal divisions or square miles, by lines crossing each other at right angles; these divisions are called sections; each section contains 640 acres.

Religion.—The *Baptists* in this state have 12 associations, 219 churches, 130 ministers, and 8953 communicants; the *Methodists*, 44 preachers, and 13,504 members; the *Presbyterians*, 38 churches, 27 ministers, 6 licentiates, and 1669 communicants; the *Roman Catholics*, 9 ministers; the *Episcopalians*, 2 ministers.

Banks.—1. One private stock bank at Mobile, capital 500,000 dollars. 2. A branch of the United States bank at Mobile. 3. A state bank at Tuscaloosa, capital about 880,000 dollars. Branch of the state bank at Montgomery, incorporated in 1832, capital 300,000 dollars: capital authorised to be increased by sale of state stock, bearing 5 per cent. interest, to 500,000 dollars. 4. Branch of state bank at Decatur, incorporated in 1833, capital to be raised by sale of state stock 1,000,000 dollars. Branch of state bank at Mobile, incorporated in 1833, capital to be raised as above, 2,000,000 dollars. The state is the sole proprietor of the state bank and its branches. The capital of the state bank is composed of the university and other public funds, and of funds to the amount of 200,000 dollars, raised by the sale of state stock, bearing 6 per cent. interest. The capital of the branch is raised, and to be raised, by the sale of state stock bearing 5 per cent. interest. [*Communication from Tuscaloosa.* See also Darby's *Geography of the United States.*]

Trade.—Years ending 30th September.

	1829.		1830.		1831.	
	dollars.	dollars.	dollars.	dollars.	dollars.	dollars.
Imports in American vessels . . .	122,322		83,908		143,320	
Foreign	104,398	233,720	60,915	144,823	81,115	224,435
Exports — Domestic produce . . .	1,679,385		2,291,825		2,412,862	
Foreign	14,573	1,693,958	3,129	2,294,954	1,032	2,413,894
	tons.		tons.		tons.	
Shipping Entered — American . .	11,883		10,490		10,126	
Foreign . .	5,400	17,283	4,826	15,316	11,480	21,606
Shipping Departed— American . .	14,494		22,277		14,707	
Foreign . .	4,953	19,447	4,059	26,336	10,953	25,660

ALABA'MA RIVER. [See ALABAMA.]

ALABASTER, a white stone used for ornamental purposes. The name is derived from Alabastron, a town of Egypt, where there appears to have been a manufactory of small vessels or pots, made of a stone found in the mountains near the town. These vessels were employed for containing certain kinds of perfumes, used by the ancients in their toilets, and with which it was the custom to anoint the heads of their guests, as a mark of distinction, at their feasts. There are in Horace many allusions to this custom. In like manner, Mary, the sister of Lazarus, poured upon the head of our Saviour, as he sat at supper, "very precious ointment" from an *alabaster*-box.

The terms ἀλάβαστρον among the Greeks, and *alabastrum* among the Romans, were applied to those vessels, even when they were not made of the white stone; for although they may have imitated the original form of the vessels made at Alabastron, they appear from Theocritus (Idyl. xv.) to have been sometimes made of gold. They were of a tapering shape, and without handles; and from this circumstance, Adam, in his Latin Dictionary, gives as the etymology of Alabastrum, *a without*, and λαβὴ *handle*, a derivation which certainly cannot be assigned to it consistently with the formation of the Greek language.

It appears from a passage in Demosthenes, (Oration on the Embassy, chap. 68,) that one of the brothers of Æschines, the orator, was employed in painting these alabaster-boxes. Pliny says, (lib. xxxvi. 12, and xxxvii. 54,) that the stone, which he calls alabastrites, was got from Thebes; but Mannert (*Geographie der Griechen und Römer*) places the town of Alabastron in Heptanomis, or Middle Egypt, in the hills between the Nile and the Red Sea, about thirty English miles east of Acoris; and states, that the stone of which the alabastra were made was brought from Mons Alabastrinus, about thirty miles S. E. of the town. Mr. James Burton, who has been long resident in Egypt, has determined the site of Alabastron to be latitude 27° 43′, longitude 31°, not far from the east bank of the Nile, a few miles south of the ruins of Antinoë.

There are two kinds of white stone to which antiquaries and artists give the name of alabaster: the one is a *carbonate* of lime; the other is gypsum, or *sulphate* of lime. Many of these ancient perfume vessels are made of the compact crystalline mass deposited from water holding carbonate of lime in solution, which is found in many places in almost every country. When the deposition takes place on the ground, it forms what mineralogists call a *stalagmite*, from a Greek word signifying a drop, and it is often composed of layers distinguishable by different degrees of translucency giving the stone the appearance of the striped agates, called onyx, (see AGATE.) Hence, according to Pliny, the alabastrites was sometimes called onyx. But it is easy to ascertain of which of the two kinds a vessel is composed, for *carbonate* of lime is hard, and effervesces if it be touched by a strong acid; but *sulphate* of lime does not effervesce, and is so soft that it may be scratched with the nail. The term alabaster is now generally applied to the softer stone. This last, when pure, is a beautiful semi-transparent snow-white substance, easily worked into vases, lamps, and various other ornaments, but it is seldom found in masses large enough for statuary; and, indeed, artists would be unwilling to execute any great work in a material so very liable to injury. The finest quality known is found in the neighbourhood of Volterra in Tuscany, and it is cut into a variety of works of great taste and beauty at Volterra, Florence, Leghorn, and other places in that part of Italy, which are sent all over the world, and sold at very reasonable prices.

Alabaster is found in Derbyshire and Staffordshire, and is manufactured into small ornaments and toys at Derby, which are also to be bought in London. The natural history of the stone will be treated of under the head GYPSUM, the general term under which all varieties of sulphate of lime are usually classed by mineralogists.

ALABES, in Ichthyology, a genus of fishes belonging to the order Malacopterygii, and family Apodes. This genus, which consists of a single species of small size, a native of the Indian Ocean, resembles in most respects the common conger-eel (Muræna) of our own seas.

ALAIS, a town in France, in the department of the Gard, part of the ancient province of Languedoc. It is on the bank of one of the streams called the Gardon, which is distinguished by the name of the Gardon of Alais. Alesia, mentioned by Cæsar in his *Commentaries* (vii. 68), which was compelled to surrender to the Roman commander after an obstinate resistance, is not the modern town of Alais, as stated in some books. (See *Dictionn. Géog.*) The Alesia of Cæsar is St. Reyne, about twenty-three miles south of Châtillon sur Seine.

Alais was formerly the capital of the district of Cevennes, and lies at the foot of the Cevennes mountains. It suffered much during the *dragonnades** in the reign of Louis XIV., who built a citadel in 1689 to overawe the Protestants. The injuries it sustained have been, however, repaired, and Alais is again a thriving place. It has several manufactories, and carries on a considerable trade in raw and dressed silk, as well as in the produce of the neighbouring country. The Protestants have still a place of worship there. The population is given by Malte Brun and Balbi at more than 10,000. The town is in 4° 4′ E. long., and 44° 7′ N. lat., and is about forty miles north of Montpellier.

Alais is the capital of an arrondissement of the same name, containing about 480 square miles, 96 communes, and above 70,000 inhabitants. It is fertile in grain, mulberries, and olives. There is coal, and also considerable iron mines in the neighbourhood.

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* An account of education in this state, containing a full statement of all details in relation to the university, academies, and schools, will be published in one of the forthcoming numbers of the London *Journal of Education*. See also *Journal of Education*, No. vi.

* The persecution of the Huguenots, or Protestants, in which dragoons were the chief instruments.

ALAKANANDA, a river of Hindostan, which rises in the Himalaya Mountains. This river is considered sacred by the Hindoo inhabitants: it flows from north-east to south-west, through the province of Gurwal, receiving in its course the waters of the Mandakini, the Pinden, the Mandacoki, the Birke, and the Dauli, all streams of inconsiderable size. The last-mentioned of these tributaries, which proceeds from the base of the highest ridge of the Himalaya chain, forms the remotest source of the Ganges. At Devaprayuga (*the junction of the gods*), a small town in 30° 9′ N. lat., and 78° 33′ E. long., and twelve miles to the westward of Serinagur, the Alakananda forms its junction with the river Bhagirathi, when the united streams receive the name of the Ganges. At a short distance before it reaches Bhadrinath—a much-frequented temple, eighty miles north from Almorah, the capital of Kumaon—the Alakananda is not more than twenty feet wide, and its actual source is concealed under an accumulation of perpetual snow. At Devaprayaga the width of the river is increased to one hundred and forty feet: during the rainy season it rises from forty-five to fifty feet above its lowest level.

The Alakananda contains a great number of fish, four or five feet long (the *Cyprinus denticulatus*), which are held in reverence by the Brahmins; and, being fed by them daily, become so familiar as to take bread from the hand. *Asiatic Researches*, and MS. Documents at the India Board, quoted in Hamilton's *East India Gazetteer.*

ALAND, a small archipelago at the entrance of the Gulf of Bothnia, consisting of one principal island which gives name to the whole group, and of a great number of smaller islands, such as Ekeroe, Fögloe, Vordoe, Lemland, &c. Some authorities state that as many as eighty of the islands are inhabited. The word Aland is properly written Åland, and pronounced Oland, which signifies the 'Land of Rivers or Waters.'

The principal island has its northern point intersected by the parallel of 60° 15′ N. lat.: the meridian of 20° passes through the island. It is very irregular in its shape, so that it is difficult to state its dimensions: the greatest length from N. to S. may be about 18 miles; the greatest breadth from E. to W. about 14. Its coasts are deeply indented, and offer several excellent ports, of which the best is Ytternäs. The island is mountainous, and of calcareous structure, with some good quarries; it has also a few streams. The grains that succeed best are rye and barley, with a little wheat: the trees are pine, fir, and beech, in sufficient quantity to furnish fuel for the inhabitants. There is also pasturage for cattle. The inhabitants, who are Swedes, are skilful seamen, and in a great measure employed in fishing, and catching seafowl. They are stated at 13,340 as far back as twelve years ago. Aland is divided into five parishes. On a small island near Ekeroe a telegraph is established. One advantage which arises to the Russians from the occupation of these islands, is the possession of ports which are less frozen during the winter season than others in the same latitude, owing to the strong current from the Bothnian Gulf, which tends to keep the sea open. This island is said to have once had a king of its own. In the later times of the Swedish possession, it was included in the government of Abo and Biorneborg in Finland; it was finally ceded to Russia in 1809. The neighbourhood of Aland is noted for being the scene of the naval victory obtained by Peter I. over the Swedes, A.D. 1714, the first great event in the history of the Russian marine. (*Dictionn. Géograph.*)

ALARCON, JUAN RUIZ DE, a Spanish dramatic writer, who lived about the middle of the seventeenth century. Though an author of great merit and well-deserved reputation, very little is known of his life. Nicholas Antonio says, that he believes him to have been born at Mexico, of Spanish parents, and that he was both an actor and a dramatic writer, scarcely equalled by any of his contemporaries, for purity of diction, elegance, fluency, and copiousness. The following plays were published in his lifetime. *La industria y la suerte; Las paredes oyen; El semejante á sí mismo; La cueva de Salamanca; Mudarse por mejorarse; Todo es ventura;* and *El desdichado en finiir. Ganar amigos; Los empeños de un engaño; Quien engaña mas á quien; La verdad sospechosa*, and several others appeared after his death.

It is by the *Verdad sospechosa* (suspicious truth) that he is best known to us. Corneille, who translated it into French under the title of *Le Menteur*, speaks of it in the highest terms. 'The argument,' says he, 'is, in my opinion, so ingenious and so well treated, that I have said many times, that I would willingly give two of my best plays to have the merit of the invention of this. I have seen nothing equal to it either in the ancients or moderns.' Molière in one of his letters to Boileau says, that he is greatly indebted to *La Verdad sospechosa.* 'When it was performed,' says he, 'I had already a wish to write, though I was not decided on what subject; my ideas were confused, but this work fixed them.'

Alarcon is undoubtedly one of the best dramatic writers of the genuine Spanish school. His plots are ingenious, and conducted in a masterly manner, his characters highly romantic. He is not so fertile as Lope in his productions, but is more correct and equal; he is as pure and elegant in his diction as Calderon, but less metaphysical; and, in general, more free from the extravagance of Gongorism, so prevalent in his age. All his compositions have more or less a moral tendency; and it is our opinion, that if the Spaniards would aim at the possession of a real national drama, it is Alarcon whom they ought to study as their model. [See Nicoláo Antonio, *Bibliot. Hispan.;* Martinez de la Rosa, *Obras.*]

ALARIC. One of the most eminent of those northern chiefs who successively overran Italy, during the decline of the western empire, and the first of them who gained possession of imperial Rome. He learned the art of war under the celebrated emperor of the East, Theodosius, who curbed the depredations of the Goths, settled them in different provinces of the empire, and recruited his armies from the youth of the nation. But they threw off the yoke, as soon as the powerful hand which had imposed it ceased to hold the sceptre, and Alaric, born of one of the noblest families of the nation, was chosen by his countrymen as their leader. Under his guidance, the Visigoths, the division of the Gothic nation to which he belonged, issued from Thrace, where they had been settled, and overran Greece, A.D. 396. Alaric took Athens, but, instead of treating it with severity and destroying its edifices, as has sometimes been asserted, it is most probable that he did very little damage to its works of art, although he carried off such as were moveable. The Goths were soon compelled by Stilicho to evacuate that country; and to return into Epirus. From time to time they entered into a temporary reconciliation with the empire, and took engagements in its pay; but as they were inconstant and arrogant, and the Greeks were timid and fraudulent, this state of friendship was never of long duration. About the year 398, Alaric, on the ground of his high military character, was proclaimed king of the Visigoths; and just about the same time Arcadius, the successor of Theodosius in the Eastern empire, alarmed at his repeated successes, attempted to identify his interests with those of the Empire by declaring him master-general of the eastern Illyrian prefecture. Thus he commanded a large part of the vast country situated between the Danube, the Adriatic, and the Black Sea. The Visigoths who obeyed his orders were thoroughly organized as an army, but as yet had few claims to the civil character and stability of a nation. They threatened both empires equally at the same time, and sold their alliance to each alternately. Alaric at last determined to make his way into the empire of the West, for the purpose of establishing a kingdom by conquest.

We cannot trace minutely the motions of the Gothic army. Early in the year 403 it appeared before Milan, which was immediately evacuated by the Emperor Honorius. Besieged in the fortress of Asta, he was on the point of surrendering, when Stilicho came to his assistance, with an army hastily recalled from the frontiers of Gaul and Germany. On Easter-day, A.D. 403, was fought the battle of Pollentia. The testimony of historians varies as to the event of it; but the advantage seems to have been on the side of the Romans. It is certain, however, that in a subsequent battle near Verona, Alaric was completely defeated by Stilicho; and was compelled by the voice of his people to accept terms which his pride would have rejected,—to ratify a treaty with the empire of the West; and to retire from Italy with the remains of his once powerful army. (See Claudian, *De Bello Getico.*)

After his retreat from Italy, Alaric concluded a precarious peace with Honorius, and even entered into his service, being nominated master-general of the Illyrian prefecture. In this capacity, he was required to enforce the claims of the court of Ravenna to certain provinces held by the eastern empire: but his efforts were ineffectual; and at the end of a few years, when his army was recruited by the German youths who were attracted by his fame, he renewed his design of establishing himself in Italy. Claiming an extravagant reward for the services which he had performed, he plainly intimated that war would be the consequence of a refusal. The demand was made in the year 408. The emperor was then at Rome, and it was debated in the senate what steps were proper to be taken. The majority were for war; but by Stilicho's advice, it was determined to buy off the enemy, by a contribution of four thousand pounds weight of gold. One of the senators exclaimed, in the language of Cicero, 'This is not a treaty of peace, but a contract of slavery.' The minister maintained the demand to be nothing more than just, as Alaric had remained three years in Epirus for the service of Honorius. While the Visigoths were at the foot of the Alps, the cowardly and weak Honorius procured the assassination of Stilicho, the only man who could still have defended the empire. His son and almost all his officers were murdered along with him. Those Visigoths who were serving in the pay of the empire had left their wives and children in the Roman cities: they were all massacred at the same time. All the treaties concluded by Stilicho with Alaric were annulled; and the court of Ravenna seemed to take pleasure in provoking an enemy whom it was unable to resist. Alaric crossed Venetia without encountering any Roman soldiers; with the rapidity of a traveller who meets with no obstruction, he advanced under the very walls of Rome, and formed the siege. An application for terms was made on the part of the Romans, with an intimation that if once they took up arms they would fight desperately. Alaric returned this pithy answer: 'The closer hay is pressed, the more easily it is cut.' He demanded all the wealth of Rome. The ambassadors asked what he would leave to the inhabitants—'Their lives.' He at length, however, consented to retire, on condition of receiving a heavy ransom. But Honorius, although he had taken no measures for the defence of his capital, constantly refused to ratify all the treaties by which it might have been saved. This obstinacy was mistaken by him for a noble pride; but it had disastrous consequences, for it brought back Alaric. He laid siege to Rome a second time in 409. The imposing name of the Eternal City seemed to inspire the barbarian with involuntary respect. He endeavoured to save it from the consequences to which he was otherwise pledged, by erecting a new emperor in the person of Attalus, præfect of the city; but the weakness of Attalus rendered it necessary for the Visigoth conqueror to undo the work of his own hands; and Honorius was reinstated on a powerless throne. A treacherous attack on the Goths at Ravenna, while the conferences were still open, exhausted the patience of Alaric. The city was a third time besieged; and Alaric entered at midnight on the 24th August, 410, when he gave the town up to be pillaged for six days, but with orders to his soldiers to be sparing of blood, to respect the honour of the women, and not to burn buildings dedicated to religion. After the limited period of plunder and vengeance, he hastened to withdraw his troops, and to lead them into the southern provinces of Italy. But he died in the course of a few months, after a very short illness, while besieging Cosenza in Calabria. His death produced a temporary reconciliation between the Visigoths and the emperor. His wife's brother, Ataulphus (Adolph), was chosen as his successor by the unanimous suffrage of the army. Ataulphus was a friend to peace, and wished for nothing beyond a settlement in the empire and the hand of Placidia, the sister of Honorius, who had been the captive of Alaric. He obtained both those objects; but in a short time was assassinated by one of his equerries. Zosimus.—Claudian.—Jornandez, *De Rebus Geticis.*—Gibbon, ch. xxix. xxxi.

ALATAMA'HA, a large river of Georgia, (one of the States of the North American Union), entirely comprised within the limits of that State. [See GEORGIA.]

ALAUDA (Lark), a genus of granivorous birds, of which upwards of sixty species have been enumerated, though the pipits, among which is our titlark, be excluded. Linnæus, Latham, and Illiger, included the latter among the larks, on account of their longish hind claw; but their slender bill, and several other circumstances, sufficiently distinguish them.

Adhering, then, to this distinction, we characterize the larks by the hind-claw, which is like the fore-claws, somewhat straight and longer than in the pipits and the wagtails. The bill is straight, and rather short and strong, the upper mandible being arched without any notch, and not longer than the under. The nostrils, situated at the base of the bill, are oblong, and protected by small plumes and bristles directed forwards. The feathers on the back part of the head can be raised up at the will of the bird into the form of a crest.

Various species of larks are found in all parts of the globe, and are everywhere distinguished by their vigilance and their singing. They are peculiarly birds of the fields, meadows, and other open places; the conformation of their feet, except in a few instances, such as the woodlark, has not adapted them to perch upon trees. They accordingly always build on the ground, making in general a rather slight though neat nest, and laying about five eggs, usually of a greyish white, with specks of a brown colour. They frequently rear two broods of young during the summer.

They are almost all birds of passage; for even in Britain, where some remain during the winter, the greater number flock together and migrate, either southwards or to the sea-coast. During these migrations immense numbers of them are caught in nets for the table, particularly on the Continent, where small birds are more sought after for this purpose than in Britain.

We shall give particular details of the several species under LARK.

ALAVA, one of the old Basque Provinces in Spain. (See BASQUE.)

ALBA (FERNANDO ALVAREZ DE TOLEDO, DUKE OF), General of the Imperial army, and Minister of State of Charles V., was born in 1508. He was the son of Don Garcia, and grandson of Don Fadrique, or Frederic, who was first cousin of King Ferdinand the Catholic, and the second Duke of Alba de Tormes. His father lost his life in an engagement against the Moors at Gelvez. His grandfather superintended his education, which was calculated to fit him both for the field and the cabinet. He entered very young into the service of the Emperor, and accompanied him in his expeditions to Algiers, Tunis, and Pavia. He afterwards followed him to Hungary; and it is said that the emperor promoted him to the first rank in the army, more as a mark of favour than from any consideration of his military talents. His reserved disposition, and the peculiar bent of his mind to politics, had at first given an unfavourable idea of his talents as a general. On the Emperor wishing to know his opinion about attacking the Turks, he advised him rather to build them a golden bridge than offer them a decisive battle. Through his wise measures, however, the emperor obtained a complete victory over Frederic of Saxony at Muhlberg, where the elector was made prisoner. He was tried by a court-martial, of which the Duke of Alba was president, and was condemned to death. The duke, it is said, urged the emperor to carry the sentence into execution; but this was not the object of Charles. Alba subsequently commanded at the siege of Mentz.

About 1556, Pope Paul IV. had deprived the house of Colonna of their states, and added them to the territory of the Church. The French favoured the Pope; and the Duke was ordered by Philip II. to proceed thither against the united French and papal army. Having obtained the title of Lieutenant of all the Austrian dominions in Italy, with unlimited power, he entered the Italian territory. In this important mission he fully answered his master's most sanguine expectations. Immediately upon his arrival, he obliged the Count of Brisac to raise the siege of Ulpian; placed Milan in a state of security; and, proceeding to Naples, where the Pope by his intrigues had caused serious disturbances, he restored tranquillity, and secured respect for the Spanish authority. He then entered the papal states, and made himself master of the Campagna of Rome, with a determination to humble both the Pope and the French; but having received fresh orders from his court, he was obliged to conclude an honourable treaty of peace with the Pope, not without telling his master that timidity and scrupulousness were incompatible with the policy of war. This proud warrior, before whom the bravest trembled, was subjected to the humiliation of asking the Pope's pardon; and, as he himself confessed, was so struck with awe at the ceremony, that he could scarcely utter a word.

About 1560 the Flemish provinces of Spain began to manifest symptoms of discontent. Philip, being a bigoted Catholic, was determined to maintain the Roman religion in all its purity throughout his dominions. He disliked the Belgians as much as his father had been well-disposed towards them; and his whole conduct was calculated rather to alienate than to gain their affection. He attempted to destroy their liberty and privileges, and establish the Inquisition, at any hazard. When one of his ministers represented to him, that if he did not abolish the inquisitorial edicts, he exposed himself to the risk of losing the states, he answered, that he 'would rather have no subjects at all than have heretics for his subjects.' A rebellion was the result of this ungenerous policy. When the news of the revolt reached Spain, the king summoned a council of state, and asked the opinion of his ministers as to the measures to be adopted towards the refractory provinces. The Duke of Feria objected strongly against the adoption of violent measures. The Duke of Alba, on the contrary, was for severity. Philip remained a moment perplexed between these two advisers; but soon decided in favour of the opinion that most accorded with his own.

Alba was furnished with troops and money, and invested with unlimited powers, for the purpose of crushing the liberties of the Belgians. He set sail from Spain in 1567, and landed at Genoa, where he strengthened his army with some Italian troops, and proceeded to Brussels. On his arrival, the country which, through the mild and conciliatory measures adopted by the amiable regent, Margaret of Parma, was comparatively tranquil, became full of alarm. Events proved that the fears of the people were not unfounded. The Prince of Orange fled to Germany, and in vain urged the Counts of Egmont and Horn to do the same. Alba summoned a council of state to his house, to consult about the best means of restoring tranquillity and repressing sedition. The two counts came as councillors, when Alba seized them, with the secretary, Cassenbrot, and put them in prison. The princess-regent, seeing herself deprived of her authority, retired to Italy, and left the government of the country in the hands of the Duke.

Immediately upon the imprisonment of D'Egmont, Alba instituted a council, composed of twelve judges, whom he named 'Judges of the Tumults;' by his victims they were called the *Court of Blood.* He was himself president. He summoned the Prince of Orange, and all the other nobles and citizens who had fled from the country, to appear before his tribunal, under the penalty of confiscation of their property. All the prisons were filled with victims, who were speedily condemned and executed. The principal cities were fortified and filled with soldiers; and a country, which had hitherto enjoyed all the benefits of rational liberty, under one of the mildest governments of Europe, was now converted into a military camp. More than thirty thousand persons sought refuge in the neighbouring countries. All the laws which curb the strong, and protect the weak, were virtually abolished: there was no other rule but the will of the tyrant.

The Prince of Orange had collected an army in Germany, with which he advanced into Friesland, and defeated a body of Spaniards at Groningen. The news of this reverse exasperated the Duke. He hurried the trials of the Counts of Egmont and Horn to a speedy conclusion. They were condemned and beheaded; and the secretary of D'Egmont was torn alive by four horses. The Prince of Orange was desirous to give battle to the Spaniards, but the Duke avoided an engagement; and by his prudent movements, without losing a single man, he caused the patriot army to disband. Alba returned to Antwerp to carry on the fortifications of the citadel. The works were soon finished; and in the middle of the fortress the Duke caused his own statue, in brass, to be erected. This statue represented him in full armour, and at his feet, a two-headed monster, referring allegorically to the nobility and the people. The whole was supported by a pedestal of marble, with the following inscription:—'In honour of the Duke of Alba, for having restored the Belgians to their allegiance to the king and the church, and the country to tranquillity, peace, and justice.' This insult was greater than a nation could endure. It was so revolting, that it alienated even his friends; and from that moment his dictatorship was virtually ended. His fall was hastened by the cruelty practised towards the inhabitants of Haarlem, where he caused more than two thousand persons to be executed, after having led them to expect forgiveness if they surrendered.

He now began to encounter misfortunes and disappointments on every side. His health was in a weak state; the greater part of Holland had openly revolted, and proclaimed the Prince of Orange stadtholder; his armies had ceased to be invincible; and he earnestly requested to be recalled. In December, 1573, he published a general pardon, and left a country which he had rendered desolate; in which he had delivered into the hands of the executioners eighteen thousand victims, and kindled a war which raged for thirty-seven years, and cost Spain the blood of her best troops, immense treasures, and the final loss of some of her richest provinces. The first act of his successor's authority was to demolish his statue; so that nothing remained in Flanders after his departure but the memory of his cruelty.

On his arrival in Spain, far from being well received at court, he was sent as a prisoner to his castle of Uceda. Four years after his arrest, Henry II. of Portugal died, leaving no rightful heir. Philip II. of Spain put in a claim, which he enforced by the sword. Alba was now summoned from his retirement, and at the head of twelve thousand men entered Portugal by Elvas. In two weeks he placed Philip in possession of the crown of Portugal. Three years after, 1583, he died at Lisbon at the advanced age of seventy-four.

The Duke of Alba was, undoubtedly, the ablest general of his age. He was principally distinguished for his skill and prudence in choosing his positions, and for his rigid enforcement of the strictest discipline in his army. He often obtained by patient stratagem those advantages which would have been thrown away, or dearly acquired by a precipitate encounter with his enemy. Being at Cologne, and avoiding, as he always did, an engagement with the Dutch troops, the Archbishop urged him to fight. 'The object of a general,' answered the Duke, 'is not to fight, but to conquer; he fights enough who obtains the victory.' During a career of so many years' warfare, he never lost a battle. The firmness, energy, and caution, of such a character as Alba, surrounded as he was by all the evil circumstances which belong to intolerance and despotism, were only instruments to render the bigot and tyrant more dangerous and odious. Under more favourable states of society, they might have produced a just and benevolent statesman. [See Mariana, *Hist. de Esp.* Bentivoglio, *Guerr. di Flandr.* Do Campo, *Hist. de Portugal.*]

ALBA LONGA, ALBANO, ALBAN MOUNT and **LAKE.** The old fabulous traditions of ancient Rome speak of the city of Alba as being founded by Ascanius, son of Æneas, about 400 years before the foundation of Rome itself. They also give a succession of kings of Alba, from Ascanius down to Numitor, grandfather of Romulus. But this story evidently cannot be considered as historical. The truth is, that Alba was a considerable city anterior to Rome, and the centre of a confederation, distinct from that of the Latins, but combined with it. [See Niebuhr's *History of Rome,* vol. i.] The site of Alba was a long narrow ledge between the lake and the mountain, on the south-eastern bank of the former, where now stands the convent of Palazzolo. This is the opinion of most antiquarians, among others of Venuti and Father Eschinardi. Sir William Gell, we understand, is of a different opinion; but his work on the Topography of the Campagna has not been published. On the mountain above, now called Monte Cavo, was the citadel where stands at present the village of Rocca di Papa. Alba was engaged in a war with Tullus Hostilius, king of Rome, to terminate which the famous combat of the Horatii and Curiatii was resorted to. Owing, however, to some subsequent treachery of the Albans, the Roman king razed Alba to the ground, and removed its inhabitants to Rome, where they settled on the Cœlian hill. This is at least Livy's narrative: but Niebuhr has strong doubts about the time as well as the manner in which Alba was destroyed; and it appears that the territory of Alba was taken possession of in the first place by the Latin confederacy, and not by Rome. There seems to be no question that many of the inhabitants of Alba, after its fall, came to settle at Rome: the afterwards celebrated family or *gens* of the Julii were among those who referred their origin to Alba. Of old Alba no vestiges whatever remain. A second town was built afterwards by Roman colonists in the time of the first emperors: it originated probably with the castrum prætorium, or camp, which was stationed in that neighbourhood. This second Alba is mentioned by Suetonius in the Life of Nero: it was destroyed after the fall of the empire, in the wars between the Romans and the people of Tusculum. Of this Alba some subterraneous remains are still to be seen.

Under Urban VIII., in the seventeenth century, the Roman nobility began again to frequent the neighbourhood of the Alban Lake, and the present town of Albano gradually arose. It stands at a short distance from the lake, about fifteen miles from Rome, on the high-road to Naples, within the territory of the Church, and is built on the site of the old pleasure-grounds of Pompey. It consists chiefly of one long street, with several palaces of the Roman nobles; it is a bishop's see, and contains more than 4,000 inhabitants. Above the town are the fine villa and gardens of Prince Barberini. The country around is delightful and salubrious, being raised high above the unhealthy plains of the Campagna. The wines of Albano maintain their ancient reputation. On the banks of the Alban Lake is Castel Gandolfo, the country residence of the Popes, and farther on is the pretty town of Marino; at a short distance from the latter is the abbey of Grotta Ferrata, inhabited by Greek monks of the order of St. Basilius, and supposed to stand on the ruins of Cicero's Tusculan villa: fine avenues of shady trees lead to these several places. The Alban Lake is seven miles in circumference, and its surface is 918 feet above the level of the sea; the shore is high, lined with trees, and covered with gardens and orchards: the water is clear, and its depth very great; some accounts say 1,000 feet. An emissary, designed to prevent the sudden overflowings of the lake which threatened the plain below, was constructed by the Romans in the year 358 after the foundation of the city; and it remains unimpaired to this day,—a striking monument of the genius and perseverance of that extraordinary people. They bored the mountain for the space of more than a mile, mostly through the solid rock: the tunnel is six feet high and about four feet in breadth. It was completed in less than one year. The water of this emissary flows into the Tiber below Rome. The Alban Mount, nearly 3,000 feet high, towers far above the surrounding hills, commanding the whole Campagna, or Latium, and forming the most striking feature of the horizon of Rome. 'The road which we took,' says Mr. Eustace, in his Tour, 'leads along the Alban Lake, and climbs up the declivity to the village of Rocca di Papa. Above that village is a plain called *Campo di Annibale*, because that general is said, I know not upon what authority, to have been encamped there for some days. The hollow sweep formed in the mountain beyond this plain has given it the modern appellation of *Monte Cavo*. Above this plain we proceeded through the woods that clothe the upper region of the mountain, and sometimes on the ancient pavement of the Via Triumphalis that led to its summit. From this grove came the voice that commanded the continuation of the Alban rites; and on the summit stood the temple of Jupiter Latiaris, where all the Latin tribes, with the Romans at their head, used to assemble once a year, and offer common sacrifice to the tutelary deity of the nation. Hither the Roman generals were wont to repair at the head of their armies after a triumph; and here, in the midst of military pomp and splendour, they presented their grateful acknowledgments to the Latin Jupiter. The effect of this temple, towering above the sacred groves, must have been unusually grand, not only in the towns and villages at the foot of the mountain, but in Rome itself, and over all the surrounding plain.' Of the temple no certain vestiges remain; the ground is occupied by a church and convent of monks of the Passion, whose chants alone break the silence of these lofty solitudes.

The Alban Mount is in the Roman poetical mythology what Mount Ida is in that of Homer—the seat of the gods who watch over the destinies of the fated city. The view from the summit is truly magnificent, extending inland over a gradation of wooded hills, as far as the barren and notched ridge of the Sabine mountains to the east, and Mount Soracte to the north; the latter rising alone over the plain through which the Tiber and the Anio slowly wind their course: farther westward the view is bounded by the rampart of Mount Cimino, the country of ancient Veii. Between these great outlines lies a vast undulated tract of country, whose softly-swelling slopes sink gradually towards the west, and merge at last into the blue line of the sea; the shore of which, girt with a dark stripe of woods, relieved here and there by white watch-towers, spreads without interruption before the eye for a space of more than sixty miles, from Civitavecchia to Antium, embracing the double mouth of the Tiber, the marshes of Ostia, the ruins of Ardea, Lavinium, and Laurentum,—the whole scenery, in short, of the last six books of the Æneid, as well as that of the first struggles and achievements of infant Rome. Hovering over the silent, dusty plain below, where immense farms now occupy the place of former cities, the eye, following the greyish lines of aqueducts and roads, is led to rest on the hundred domes, and towers, and palaces of modern Rome—St. Peter's ball and cross rising proudly above the rest; the whole encircled by a narrow zone of gardens and vineyards, like an oasis in the midst of the desert.

The Alban Mount is of volcanic formation; and the basin of the Lake of Albano, as well as that of the neighbouring smaller Lake of Nemi, are evidently extinguished craters. The whole of this delightful region is healthy, well cultivated, and thickly inhabited. It is a convenient place of resort for the nobility and gentry of Rome in summer, and especially in the autumn. [See Piranesi, *Antichità di Albano e di Castel Gandolfo*.]

ALBANI, a patrician Roman family, originally from the town of Urbino. One of its members, Cardinal Gian Francesco Albani, was raised to the papal see in 1700, when he assumed the name of Clemens XI. Since that time the Albani have been classed among the Roman princes, and have furnished the Church of Rome with a succession of cardinals, who have been in general men of taste and abilities, and have exercised considerable influence at the papal court. Cardinal Alessandro Albani, in the last century, was known as a patron of the arts, to which he devoted his fortune. During the course of fifty years he enriched his villa outside of Porta Salaria with a magnificent collection of statues, marbles, relievos, and other precious objects of art, which rendered the Villa Albani one of the most interesting spots about Rome. When the French republican army invaded Rome in 1798, this villa was stripped of all its treasures; Cardinal Albani having shown himself averse to France, and having urged the pope to form a league with the other Italian states to oppose the French arms. The cardinal, however, escaped to Naples. After the death of Pius VI., Cardinal Albani repaired to the conclave at Venice, which elected Pius VII., and soon after died at an advanced age. The lay representative of the Albani family is possessed of the estate of Soriano near Viterbo, and of other domains in the papal states. [See CLEMENS XI.]

ALBANIA, a country of European Turkey, stretching along the coast of the Adriatic and Mediterranean Seas. It is difficult to define the exact limits of Albania, but the following account is, perhaps, nearly correct. It is bounded on the N. by the mountainous district of Monte Negro, (from which the river Moroka divides it,) and by the ridges which connect this district with the great central chain, anciently known by the name of Scardus. The eastern boundary is uncertain. It nearly coincides, however, with the line of the mountains running southward from lat. 42°, not far from the 21st meridian, east from Greenwich. From lat. 40° it runs S.W. and meets the sea-coast a little to the northward of Prevesa. Albania thus has Hertsek, or Turkish Dalmatia, with the territory of Monte Negro on the N.W.; Bosnia and Servia on the N.; Roumili or Roumelia on the E. and S.E., and the Mediterranean Sea on the W., along which the coast runs for more than 200 miles. It will be seen to coincide with the southern parts of ancient Illyria, and the northern of Epirus. These are the limits of Albania properly so called, (*i.e.* of the country in which the Albanian language is the vernacular tongue), and they exclude the districts of Joánnina, Arta, Kónitza, and Paleo Pogóneana; but as these districts formed part of the territories of the late Ali Pasha, in whose times this country has been most frequently visited, and as they will hardly come into any of the great territorial divisions of Turkey, they will be spoken of as parts of Albania in this article. The eastern frontier must then be considered as advanced to the ridge of mountains, between the river Aspropotamos [see ACHELOUS] and the river of Arta; and southward to the gulf of ARTA. Albania is a mountainous region; ridges intersected by deep ravines cover the southern part of the country: the northern part is not so well known, having been less visited by travellers. The Acro-Ceraunian mountains, now called Khimára, after running north-west nearly parallel to the coast, form a bold headland just at the entrance of the Adriatic. The rugged rocks heaped one upon another, with their summits hidden in the clouds, and their base washed by a sea continually agitated, were regarded with apprehension by ancient navigators. The hills of Zagori running S.E. near the frontier of Albania and Macedonia, have flat summits spreading into extensive plains. A semicircular chain of lofty mountains, once known by the name of Scardus, and now called Gliubotin and Nissava Gora, incloses the basins of the Moroka and the Drin; and a continuation of it runs southward, under the denominations of Tzumerka and Metzovo, uniting with the ancient Pindus; but Pindus itself cannot be considered as within the limits of Albania, &c. The character of this range is hardly determined. It is doubtful if it forms a continuous chain, or an elevated ridge, crowned at different distances by lofty hills. The mountains of Khimára and Tzumerka are not less than 4000 feet above the level of the sea.

The rivers of Albania are not of any great size or importance. They flow from the eastern frontier into the Adriatic or the Mediterranean. The Moroka and Paskola unite their streams, and pass through the lake of Skutari (Skódre), or Zenta, into the Adriatic, assuming between the lake and the sea the name of Boyana. The general direction of the Moroka is S.; of the Paskola S.W.; and the distance from the source of the Moroka to the mouth of the Boyana, following the winding of the stream, and including the length of the lake Scutari, is more than 100 miles. Two streams, one, the black Drin, flowing in a northerly direction, or from L. Okhrida (ancient Lychnitis); the other, the white Drin, proceeding from the mountains on the frontier, and flowing S., meet and run westward into the Adriatic. The windings of this stream, measured from either source, render its course equal to about 150 or 160 miles, and make it the chief of the Albanian rivers. Farther to the south, we meet with the Skombi (ancient Genusus), the Beratina, or Krevasta (ancient Apsus), and the Boiussa or Voiussa, in whose modern appellation we may trace the ancient one of Aous or Æas. This last-mentioned stream is about 130 miles long; but these measurements, founded on the most recent maps, must, in the present state of our knowledge, be received with caution. The river Calamas, the ancient Thyamis, falls into the sea opposite Corfu; and farther to the south we have the ancient Acheron, and the little river of Arta, which falls into the gulf of Arta on the north side. The principal lakes are those of Scutari or Zenta; of Okhrida, the ancient L. of Lychnitis, of Joánnina, which has been confounded with the ancient Acherusia; and of Butrinto. Of these, the second, according to the map published by the Society for the Diffusion of Useful Knowledge, is the largest: that of Joánnina is given by Hobhouse as 10 or 12 miles long, and 3 broad.

The climate of Albania in the lower regions is, perhaps, about as warm as that of Italy, but droughts, and sudden and violent north winds, render it less agreeable. In the part which lies south of lat. 40°, and which corresponds to the ancient Epirus, the climate is colder than in Greece. The spring does not set in before the middle of March: in July and August, the oppressive heat often drains the streams and rivers, and withers the plants and grass: September is the time of vintage; and the rains of December are succeeded by frosts in January, which, however, seldom last long. The country is in general healthy. Tertians indeed prevail at Joánnina in spring and autumn, owing, probably, to the vicinity of so large a sheet of stagnant water as the lake on which the town stands.

Of timber trees may be mentioned many species of oak, among them the *quercus cerris*, with its broad indented leaves, and large hairy-cupped acorn, affording timber of good size and quality; and the Vallonea oak (*quercus ægilops*), the acorns of which are deeply set in a thick scaly cup used in dyeing, and supply an article of export from many parts of Turkey: the plane, the cypress, the ash, the cedar, the pine, and the larch may be added. The last three appear in the mountains of Pindus, together with the chestnut; the three which precede them are mingled on the sea-coast with the laurel and the lentisk. The wild vine and the elder are also frequent on the mountains, and the woods and wastes nourish the Amphilochian peach, the Arta nut, and the quince. The cultivated fruits are the olive, which might be rendered more productive by better care; the vine, the pomegranate, the orange, the lemon, the mulberry, and the fig. The agricultural produce consists of barley, oats, maize, and other grains, tobacco, and cotton; some portion of it is exported. The horses are spirited and active, but not large; asses are also used; the oxen are ill-shaped and stunted; flocks of sheep and goats* are numerous. Considerable numbers of all these animals were, and probably continue to be sold into the Ionian islands. The dogs which Mr. Hobhouse saw on his road from Arta to Joánnina, were not unlike the true shepherd breed in England; but were larger, (being nearly as big as mastiffs,) with sharper heads and more curled and bushy tails.

Fowls and eggs are abundant. Mr. Hobhouse, in one of his journeys through the country, speaks of these two, with wine, being his constant meal. Among the wild beasts are the bear, the wolf, and the jackal. The lakes abound with water-fowl.

The inhabitants of Albania consist chiefly of Greeks and Albanians properly so called, with some few of other nations intermingled with them. We shall here confine ourselves to the Albanians, who have attracted considerable attention in modern times, from the celebrity of the late Ali Pasha, and from the accounts of them given in the travels of Mr. (now Sir John) Hobhouse in 1809, and of Dr. Holland in 1812 and 1813, and in the *Researches in Greece* of Col. Leake, who resided in Albania a short time previous to the date of Mr. Hobhouse's journey. These writers, with M. Malte Brun, we have taken as our chief guides, and we refer to their works for more particular information. It may be mentioned, that the two men who have attained the greatest eminence under the Turkish sway in modern times have been Albanians; viz., Bairacter, whose successful rebellion placed the present Sultan Mahmoud on his throne, and Mohammed Ali, Pasha of Egypt, who has nearly expelled him from it.

The Illyrians were probably the original stock from which the Albanians sprung. Ptolemy mentions a tribe of *Albani*, in the district with a town called Albanopolis; but they appear to have been insignificant, and till the 12th century we lose sight of them. At that period we read of their town under the name of Albanon, Arbanon, or Elbanon, and it is said to have commanded the passes from the country around Lychnitis to the coast. From this people, the Byzantine Greeks gave to the inhabitants of these mountains, who spoke the same dialect, the name of Ἀλβανῆτες (Albanetes), Ἀλβάνοι (Albanoi), or Ἀρβανῆτες (Arbanētes); and to the country that of Ἀλβανία (Albania), Ἀλβανητία (Albanētia), or Ἀρβανητία (Arbanētia). Hence the European names of the country. The Albanian, however, calls himself Skipitar, and his native land Skiperi.

The hypothesis of the Albanians being descended from the Illyrians, cannot receive confirmation from comparing it with the old Illyrian tongue, because we know nothing about the latter. Still the Albanian language, whatever may be its basis, has received accessions from the Greeks, the Romans, the Goths, the Sclavonians, the Franks, and the Italians; with whom, at different times, the Albanians have been connected and intermingled.

Some writers have assigned to the Albanians a different origin; supposing them to be the descendants of the Albani of Asia, who dwell between the Euxine and the Caspian seas, and who may (it is conjectured) have retired before the advance of the Sclavonian nations, that for some centuries followed the track marked out by the Huns, when they broke into Europe. Mr. Hobhouse, who adopts the above hypothesis, describes the modern Albanians as a mixture of Greeks, Romans, Goths, Vandals, Spaniards, Italians, Bulgarians, and Ottoman Turks, and supposes (though we believe it to be a mere supposition) the basis of their language to be the Sclavonian. Pouqueville asserts the existence of a belief among the Albanians themselves that they are descended from the French; and Meletius, a geographer of the last century, says they are descended from Celts who crossed over from Iapygia, now the Terra di Otranto, in the kingdom of Naples.

In the ninth and tenth centuries, Albania was included in the great Bulgarian kingdom, established south of the Danube, of which Lychnitis was the capital. In a subsequent period we find the Normans of Sicily and Tarento in permanent possession of some places on the coast. Durazzo was at once their depôt and place of shelter. On the capture of Constantinople by the Franks [A. D. 1204], Michael Angelus, a bastard of the family of the Comneni, founded, what was called the Despotate (Δεσποτατον, Lordship), a principality, comprehending the ancient Ætolia,

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* The milk of these animals is made into cheese, a small quantity of which is exported; and their skins serve to hold wine (to which, however, they impart a strong flavour); the flesh of the kids is considered equal to lamb.

Acarnania and Epirus, including the towns of Joánnina (which became the capital), Arta, and Nepakto (or Naupactus). The despots were sometimes tributary to the emperors of Constantinople, at other times independent, or even hostile. The town of Albanon was, in 1257, subject to a governor sent by Theodore Lascaris II. emperor of Nice, (one of the sovereignties which sprung up on the above-mentioned capture of Constantinople;) but as the Albanians preferred the sway of the despot, the governor retired. It was probably about this time that the Albanian name was extended to all those mountaineers of Illyricum and Epirus, who were united by community of language and manners; and, as it should seem, they constituted a separate and independent community, which formed alliances at will with the Greek emperors, the Franks, or the despots of Epirus. Durazzo was in their hands, but Berát, in the heart of their country, was subject to Constantinople.

In the fourteenth century the power of the Albanians was so far increased as to lead them to attempt conquests distant from their mountains, but they could not retain their acquisitions. Some of their northern towns were taken by the Venetians; and the nation ultimately bowed to the supremacy of the Turks. The valour of the celebrated George Kastrióte, or Castriot, called by the Turks Iskander (Scanderbeg), could only delay the subjugation of his countrymen. He died in 1466 or 1467; and the Turks completed the conquest of Albania in 1478. The people, indeed, were never entirely subdued, nor does it appear probable that the sultan ever had more authority than at present, when he cannot appoint a governor who is not a native of the province: but the conquest, though imperfect, was the cause of considerable changes. In the days of Castriot the Albanians were Christians, and most of them continued to be so till the middle of the seventeenth century. They are now half Mohammedan, but their conversion is probably owing to policy, that they may attain to high dignities; and their adherence to the usual practices of the Moslems is by no means of a rigid character. They intermarry with Christian women, and the children are divided between the opposite creeds of their father and mother, the boys going to the mosque, and the girls to church. Their laxity is a subject of ridicule to the more consistent Turks. The Albanians of the coast are mostly Christians, and some of them of the Latin church.

The Albanians are about five feet and a-half high, muscular and straight in their persons. Their activity and the tight girdles which they wear render them small round the loins: they have broad full chests, long necks, long oval faces, with prominent cheek bones, and flat raised foreheads, arched eyebrows, blue or hazel (rarely quite black), lively eyes, thin straight noses, thin but open nostrils, and small mouths, furnished with good teeth. Their complexions are white in youth, but get tinged or dusky in old age. They wear mustachios, but shave off the rest of the beard. Their features show a mind unsubdued by slavery, and their stately walk and carriage may be denominated a strut. The women are tall, strong, and not ill-looking; but their appearance indicates wretchedness, ill usage, and hard work. They are not so early marriageable as the women in southern Greece, but they retain their looks longer, and give birth to children at a more advanced period of life.

The dress of the better sort consists of an outer mantle, made of coarse woollen stuff, bordered and variously figured with red threads, which, falling loosely from the shoulders behind, reaches as low as the knees; of two vests (the rich sometimes adding a third), the outer one, open, the inner, laced in the middle and richly figured; of a broad sash or belt, with one or two pistols, the handles of which are often long, and curiously wrought with silver; of a coarse cotton shirt, the lower part descending from beneath the belt like a highland kilt, with drawers of the same materials; and of variously coloured stockings, or high socks, and sandals. They wear also a small red skull-cap, and metal greaves or coverings for the knees and ancles. The most remarkable part of an Albanian's dress, is the capote or cloak, a coarse shaggy garment, either of a gray or white wool, or black horse hair, with open sleeves, and a square flap or cape behind, which serves sometimes for a hood. The richer Albanians often add to their dress a shawl tied on the head like a turban.

The dress of the common people is usually composed of materials which once were white; but the clothes of an Albanian, owing to his scanty wardrobe (which rarely contains more than two shirts), and to his habit of sleeping dressed on the ground, present a very unsavoury appearance. They are, in fact, very filthy in their persons, and infested with vermin, which they brush from their clothes without shame for themselves or consideration for others. The poor seldom wear their sandals.

The Albanians are fond of ornaments. They wear silver chains round the neck with amulets, silver snuff-boxes, or watches, with shagreen cases, at the end. Of one ornament in particular they are very proud and careful. It is a copper, or sometimes a silver pencase, a quarter of an inch thick, (some say as much as an inch and a half,) and ten or eleven inches long, with an inkstand at one end. This they often wear in their girdles, adorned with a silver chain, even when unable to use it. The poor all carry at least one pistol in their girdles; and are especially proud if they can have the handle of silver, being comparatively careless about the barrel or the lock.

The dress of the women is fantastical, but they are more cleanly than the men. The women at Cesarades, a town which Mr. Hobhouse passed through, were chiefly clothed in red cotton, but he never observed this colour elsewhere. Their heads were wrapped in a shawl, so arranged as to look like a helmet and crest, with clasps under the ears. At Ereeneed, a place not far from that last mentioned, the garments of the women were of white woollen, and the younger ones wore a kind of skull-cap composed of silver coins. Their hair also, which fell down in long braids, was strung with money, so that the young girls thus carry their portions (as they collect them) on their heads.

The food of the Albanians consists of wheaten or barley bread, but principally of cakes of boiled or roasted maize; of goats'-milk cheese, rice, butter, eggs, dried fish, and vegetables. The proportion of animal food is but small. On holidays they kill sheep, or kids, or fowls. Their diet is usually spare; but this arises from parsimoniousness, as they will eat voraciously when they can do it at the cost of others. They all drink wine, as well as rackee, a spirit distilled from grape husks and barley, and not unlike whiskey. They drink also abundance of cold water, (and that when they are hot, without finding any inconvenience,) some coffee, the Italian rossoglios, the liqueurs of Corfu and Cephalonia, and a little milk. The wine, made in quantities and kept in casks in Joánnina and other large towns, is mixed with fine resin, lime, and water. The resin is to impart strength, but is counterbalanced by the water; the lime is intended to refine the liquor. This process, however, imparts a harsh flavour.

Their habitations are for the most part very neat. The cottages have seldom more than one floor and that of mud, which is regularly swept, and is quite dry. The rooms are commonly two, one of which is appropriated to the store of maize in the stalk, and of grapes which are sprinkled with salt. The fire is made on the floor, and as they have only a hole to serve as a chimney, it is not surprising that their apartments are sometimes smoky. Their furniture is very simple. A large circular tray of thin iron or tin, is used for eating on, and is kept well scoured and very bright. They have also a pan to mix meal in, a wooden bowl or two, some horn spoons, jars for oil and wine, and a small copper coffee jug. A brass lamp, three or four white rush mats, and a block of wood about a foot high, serving as a stand for the eating tray,—all which articles, as well as those previously mentioned, are kept in a deal cupboard or wooden chest,—complete the list of an Albanian's domestic utensils.

Their houses are detached with a garden to each. The house in which Mr. Hobhouse lodged, at Ereeneed, had belonging to it a tobacco patch, a vineyard, and a fruit and vegetable garden, all surrounded by a stone wall. The house was in an inner yard, so walled as to form a sort of fortification, with holes in the wall, placed at regular distances, and said to be intended for guns.

Their villages have a green with a large tree for holiday sports. On this green is the circular paved threshing-floor, where the corn is trodden out by horses, who are fastened by a cord to the post in the centre of the floor, and driven round, sometimes to the number of eight or nine abreast.

A distinguishing feature in the character of the Albanians is their nationality. Their answer, when asked what they are, is not, as in other places, 'I am a Mohammedan,' or 'I am a Christian,' but 'I am an Albanian.' In fact, their independence and love of country have almost entirely removed that distinction between the professors of the two religions which prevails so much in other parts of the Turkish empire. The laxity of the Mohammedan portion of this singular people has been already noticed. Their nationality accompanies them when they leave their native land. In foreign parts they will go out of their way to visit a countryman, although he may be personally a stranger to them.

They are proud of their prowess; and, indeed, they are a nation of warriors, being all capable of using the sword or the long gun. The latter (and, indeed, the sabre too) is to be found in almost every cottage. The imperfection, however, of its make (for the locks are usually rude, and the barrels thin and badly manufactured), and the coarseness of the powder, render it far from an efficient weapon, and prevent the Albanian from acquiring much skill as a marksman. As all carry arms, it is difficult to distinguish the peasant from the soldier.

Although the poorer classes among the Albanians will not steal, or, at any rate, are less addicted to theft than the same classes among other people, yet open robbery, upon a large scale, is not considered disgraceful. Men will commonly, in reference to a past event, speak of it as occurring when they were robbers. It is impossible to avoid observing the strong points of comparison between the habits of the ancient Greeks, among whom robbery and piracy on a large scale were honourable professions, and those of the inhabitants of modern Greece, and other parts of European Turkey. Early in the summer, bandits leave the towns and villages in which they have passed the winter, and, forming large bands of two, five, or seven hundred, or even a thousand men, retire to the tops of some mountains—those of Metzovo, for instance—and there live in caves or in the open air; making Greece, however, and not Albania, the scene of their depredations. The shepherds are often in league with them, and their flocks supply these predatory bands with meat; they procure bread from the peasantry. A gentle tap at the cottage door is heard in the stillness of the night, and the well-known word 'Psomè' (bread), informs the inmate of the nature of an application with which he immediately complies. These robbers are very cautious in making their attacks. They lie quietly in wait, and suffer their prey to get quite into the midst of them. If the party to be attacked is strong, they fire without rising from their covert until either they are repelled, or have obliged their victims to cry quarter. The prisoners are gagged, bound, and plundered; and, if wealthy, detained until they are ransomed. If there is no expectation of resistance, the robbers start up from their place of ambush without firing. Resistance is frequently, however, made with success: the assailed getting behind stones and returning the fire of their opponents,—who are very slow, unless they have great advantage in number, in attacking with the sabre.

The population of Albania has always been of a warlike character. They were the soldiers of Pyrrhus, one of the most formidable opponents whom the Romans encountered; and under Scanderbeg they arrested for awhile the tide of Turkish conquest. At present, under the denomination of Arnauts, they rank among the flower of the Ottoman army, and are found as mercenaries in all parts of Turkey and in the Barbary States. They take the field without baggage or tents, and are far more active than the generality of the Turkish soldiery. Abstemious in their habits, a ration of one or two pounds of wheat or maize flour, with a few black olives or salted pilchards, suffices for their wants. While daylight continues, they are engaged in wrestling or other warlike exercises. If wounded, they leave their corps and go home to get cured, after which they return to the field. Many of them know how to set a bone in their rude manner; and they will even attempt some of the more delicate operations of surgery. They follow the profession of arms till they become decrepit. Besides the annual resort of the robbers to the mountains already mentioned, the migrations of some of the shepherds require notice. These, with their flocks, their horses, their moveable houses, their goods, their wives and children, remove at the commencement of summer to the mountains, and return when the approach of winter renders the milder climate of the plains more desirable.

Their agricultural skill is not great. Their plough is of simple construction; and in time of harvest they reap their corn, though with little skill, and they never mow it. The business of sowing and reaping is left to the women and to *the aged*. The young men fell timber or dress the vines: nor are they averse to the occupation of shepherds, as it enables them to indulge that idleness to which, when not engaged in war, they are so prone. Their indolence, however, does not give them that grave and torpid air which distinguishes the Turks.

They look upon the female sex as cattle, make them labour, and beat them: yet all marry who can; marriage being in itself a sign of wealth. Mr. Hobhouse witnessed a nuptial procession at Joánnina, during his abode in that city. The marriage had taken place in the morning, and the bride had returned to her own apartments, in the harem of Ali Pasha, where, while unmarried, she had been a slave. In the evening, the bridegroom, a Christian Albanian, an officer in Ali's service, went to fetch her, being accompanied by a party of men, some with fiddles and others with lanterns of coloured paper. On the return, the bridegroom with his party went first; then came six young girls, splendidly dressed, two of them carrying infants. After these followed a woman, in still richer attire, bearing a small red trunk, in which was the portion given by Ali to the bride, as having been attached to the harem. The bride herself came next, bearing, in dress and in rigidity of muscle, a closer resemblance to the wax figure of Queen Elizabeth, in Westminster Abbey, than to anything else. Her face was painted, and her high cap studded with pieces of gold money.

Most of the Albanians speak Greek, which is also the common written language in use among them, for their own vernacular tongue is unwritten. Very few of them, even though Mohammedans, can speak Turkish. The Greeks of Joánnina, of the better sort, are well instructed in the manners and languages of Christendom; and that town once furnished a residence to travellers both safe and agreeable. At the present moment the town is in a most ruinous condition, having suffered a great deal at the time of Ali's assassination in 1820, and having been plundered five times since by the Albanians. (*Sketches in Greece*, &c. London, 1833.)

Dancing is one of their most common amusements. The musical instrument in general use among them is a kind of guitar, with three strings, a long neck, and a small round base. They strike the chords, not with the hand, but with a piece of quill, half an inch long. Its sound, as may be supposed, is monotonous. It is just sufficient as an accompaniment to their songs and to mark time.

A distinction of character may be observed between the Albanians of different districts. In the northern part of the country, which is better adapted for cavalry, the national character is alloyed by the dulness of the Bulgarian. It is in the narrow vales and on the barren mountains of the south that we must look for that character in its full development. There the hardy natives, ignorant of horsemanship, and constituting an irregular infantry of the hardiest and most active character, are constantly seeking to be engaged in war; and, when their own feuds do not open to them a field, they seek employment as mercenaries with the Pashas of other provinces. They may be compared, in point of character, with the independent mountaineers of Greece, whom they excel in evenness of conduct, in prudence, and in faithfulness to employers; while they surpass them, also, in avidity, selfishness, and avarice. The same activity, keenness, and enterprise, and the same hardy, patient, laborious habits, mark both races.

The Albanians have few arts or manufactures. A considerable number of capotes are exported annually; and they produce some embroidery on velvet, stuff, and cloth, for which the country enjoys a better reputation than any other part of European Turkey; but this is the work of the Greeks of Joánnina, who are an industrious people, rather than of the Albanians. The physicians in large towns are Greeks, but the surgeons are commonly Albanians: their practice is, however, of a very inartificial and somewhat violent character.

The country is under the government of the different Turkish Pashas in whose territories it lies,—as those of Joánnina, Scutari, Okhrida, Avlóna, and Delvino. But in a country of such character, and inhabited by such a people, the power of the Pashas, unless wielded by a hand like that of Ali, may be regarded as very small. The local authorities are constituted very differently in different places. Here a district or town is under the control of one man, bearing the Turkish title of Bolu Bashe, or the Greek title of Capitan, or else some designation borrowed from Europe: here an Aga or Bey becomes a petty chieftain of the villagers; while in other places, as in the town of Argyro-Castro, there are no local authorities. (See Hobhouse's *Travels.*) How far this state of things has been affected by the overthrow of Ali Pacha, we have not at present any means of learning. The authority quoted in the preceding page leads us to suppose that Albania is in a most disorderly condition.

The population of a country such as Albania cannot be estimated with any tolerable accuracy. Upper Albania, beginning either at Delvinaki or Tepellene, is generally more populous than the districts to the south. The population of Ali's dominions was estimated, by Dr. Holland, at 2,000,000; but these dominions stretched far beyond Albania, regarded even in the wide extent in which we have been speaking of it. We do not see how any calculation worth trusting can be made.

The trade consists mainly in the exchange of natural productions for the manufactures of nations more refined. Oil, wool, wheat, maize, and tobacco, are sent to the ports of the kingdom of Naples, or to the Ionian Isles and Malta; and sheep, goats, cattle, and horses, to the Ionian Islands. Cotton-wool and timber are exported from the Gulf of Arta; but the cotton is brought chiefly from Thessaly, and the timber from ancient Acarnania, on the south side of the Gulf. The manufactured goods which they export are capotes; gun and pistol stocks, mounted in chased silver, plain and gilt; and embroidered velvets, stuffs, and cloths. They import some coffee and sugar from Trieste; knives, sword-blades, gun-barrels, glass, and paper from Venice; and gold and silver thread, for embroidery, from Vienna. French and German cloth, of coarse, thin texture, ill dyed, and altogether inferior to the worst English cloth, is sent from Leipsic, probably through the medium of Greek houses at Trieste. Caps are brought in from Trieste, Leghorn, and Genoa; and various articles from the Ionian Isles and Malta, which being landed at the ports of Prevesa, Sallora, Avlóna, and Durazzo, are conveyed on horseback to the great annual fair of Joánnina. (See Hobhouse's and Holland's *Travels;* since which time things may have changed.) Linen, velvet, gunpowder, fire-arms, and iron wares, are also imported. The want of ready means of communication is a great impediment to traffic. Goods are conveyed by pack-horses; four or five of which are attached to each other by cords, and guided by one man. The vigorous government of Ali, by the suppression of robbers and the construction of roads, afforded facilities for internal traffic which did not previously exist.

The revenues of the late Ali Pasha arose from a land-tax, irregular in its assessment, but averaging probably ten per cent. of the produce; an arbitrary tax on cities and towns, depending on the necessities and will of the Vizier; duties on exports and imports; the assumption of a right to all property when there are no male heirs, founded on the general custom of the Turkish empire; a tax on decisions upon litigated property, equal to about ten per cent. of the value of the property; requisitions, on particular places, to aid in buildings or other works carried on by the government; and a partial monopoly of the corn trade. The actual contribution to the imperial treasury at Constantinople is not known. Ali had immense private revenues, and also considerable hoards of treasure.

The Albanians, as might be expected from their imperfect civilization and their peculiar habits, are divided into tribes, each having its proper designation, and distinguished in some particulars from the adjacent tribes. The most northern, and, if we may judge from the extent of country occupied by it, the largest tribe is that of the Ngége, Guegues, or Red Albanians, who inhabit the country watered by the branches of the Drin. The Mirdites, from whom Scanderbeg arose, and who owe to their priests a degree of civilization which distinguishes them favourably from their neighbours, appear to be a subdivision of these. Southward from the Ngége, are the Tóske. The Liápe, notorious for poverty, dirt, and pilfering; and the Tzámi, succeed these as we advance towards the south; and other tribes, either detached from the more important ones, or else entirely unconnected with them, occupy small portions of the country. (See *Leake.*) Among these, the people of the district of Khimára may be noticed for their indulgence of revenge, which they regard as a sacred duty, and which converts their different villages or towns into hostile stations. Some Bulgarian, and some Wallachian colonies may be found scattered along the eastern frontier of Albania. This division by tribes is purely Albanian, and was probably in use before the Turkish conquest. Upon that event, several of the chief towns, as Délvino, Berát, El Basán, Avlóna, Skódre, and others, became the seats of Turkish provincial governments.

Some notice of the chief towns of Albania will be found in the articles under their respective names. No one of them can be designated as the capital; for the country is not under the government of one Pasha. Joánnina, which is indeed beyond the boundaries of Albania strictly so called, is the most important: and after it may be mentioned Skódre, Okhrida, Berát, Durazzo (the ancient Dyracchium), Délvino, Argyro Castro, Avlóna, Prevesa, and Arta. Parga was, till delivered up to the Turks, a town of considerable size, having 8000 inhabitants. These were Christians of the Greek and Latin churches. The people of Antivari and Dolcigno are chiefly Mohammedans. Their situation on the coast leads them to become sailors, and they are the only Albanians who have any acquaintance with shipping. They enter into the service of the Barbary States, or follow piracy at home. This last is the case, at least, with the people of Dolcigno, which has a town with 6000 inhabitants.

Albanian colonies are to be found in different parts of Turkey and Greece, especially in the ancient Attica, Bœotia, Argolis, Elis, and Laconia; but these are labourers. The warlike character of the nation is retained only by those who remain at home; and in the Morea the language is nearly lost, while in the Attic villages it is retained; these being probably colonies of later date. The people of Hydra are descended from Albanian colonists, but are scarcely distinguishable from their neighbours. But the most remarkable colony is in Calabria, where the Albanians settled upon the Kastrioti receiving a Neapolitan dukedom. Their descendants, when Mr. Swinburne travelled in 1780, amounted to 100,000, and retained the Albanian dress. The women could only speak Albanian. The men could, however, speak the Calabrese also; and their original language seemed to be gradually yielding to that of their adopted country. There are also Albanian colonies in the Abruzzi. [See ABRUZZI.]

ALBANO (FRANCESCO), was born at Bologna, March 17, 1578, and was destined by his father, a respectable silk-merchant, to follow his own profession; but his uncle, who happened to be a man of taste and a judge of art, perceiving in the youth such indications of genius for painting as to warrant the expectation of future eminence, prevailed on his father to change his intentions, and he accordingly was placed under the tuition of Denys Calvert. Guido Reni was studying at the same time under that master, a circumstance extremely fortunate for young Albano, with whom Guido formed a strict intimacy; and being more advanced in art, he was enabled to afford him effectual assistance in his studies. The two youths quitted Calvert, and placed themselves under Ludovico Carracci, whose school began about this time to be conspicuous in Lombardy, and under that great master they pursued their studies with an emulation advantageous to both. Having made considerable proficiency in the principles of the eclectic school, Guido proceeded to Rome, whither he was followed by Albano, whose talents soon excited attention in that metropolis of art. Annibale Carracci had been employed to ornament the chapel of San Diego, in the National Church of the Spaniards; but being disabled by illness, he recommended Albano to continue the work, which he finished so successfully as to obtain universal applause. He was next employed by the Marquis Giustiniani to embellish his villa at Bassano, where he painted the story of Neptune and Galatea, and the Fall of Phaeton. He executed also, in the Verospi palace, several mythological subjects, chiefly from Ovid, which exhibit great learning, taste, and ingenuity. His fame now began to spread throughout Italy, and he was invited by the Duke of Mantua to his court, where he remained a considerable time, and painted several pictures. Two from the story of Diana and Actæon, and Venus and Cupid, were considered particularly successful.

Among the large works executed by Albano, after his return to Rome, are an altar-piece in the church of St. Sebastiano, representing the martyrdom of that saint; and a picture of the Assumption, painted in conjunction with Guido. Some subjects are also in the tribune of Madonna della Pace. The best, at Bologna, are the Resurrection, in Santa Maria de Galeria; the Baptism of Christ, in San Gregorio; and in San Bartolomeo, the Annunciation. It is on his small pictures, however, that Albano's reputation is chiefly founded. He had neither power of conception, nor vigour of execution adequate to the performance of large works. Some of those last-mentioned, however, are tolerably successful, having been painted while he was fresh from the impression of the school of the Caracci, or excited by immediate competition with Guido; but the natural bent of his mind was towards subjects of feminine and infantine softness, to high finishing, rather than bold effect. All his latter works are small and elaborate; they became extremely fashionable during his day. Yet even in his favourite class of compositions, Albano is by no means entitled to high praise. It is strange that in his delineations of infantine character, studied from models immediately before him, (his own children,) and in the familiarity of domestic intercourse, he should not occasionally have caught some of those happy accidents, those momentary graces of action and expression, which children, when free from constraint, continually exhibit. But Albano's grace is entirely conventional. This species of affectation, however, has always had its admirers, and Albano is extolled for it by Malvasia in a ludicrous strain of criticism; 'Albano did not,' says he, 'feign Cupid heavy and sleeping as Guido did, but represented him majestically seated on a throne, &c.' The same artificial character pervades the landscape backgrounds of Albano. There is, nevertheless, in these landscapes, an occasional association of classical imagery which has an agreeable effect. Albano was well acquainted with antique sculpture, but displays no indication of such knowledge in his male figures; his women and children are better drawn. He might have become a good colourist, but for that anxious and elaborate mode of finishing which impairs the brilliancy of his tints, and gives his flesh the appearance of ivory. With all these deficiencies, the pictures of Albano have an originality, or rather a peculiarity, by which they are immediately recognized. There are, at Burghley-house, the seat of the Marquis of Exeter, some tapestries from his designs. Three of his pictures; viz., the Three Marys at the Sepulchre, and two Holy Families, are well engraved by Sir Robert Strange. Albano died Oct. 4, 1660.

ALBAN'S, St., a borough-town in Hertfordshire, situated close to the site of the ancient Verulamium (Verulam), being separated from it by the small river Ver, a feeder of the Coln. Verulamium was probably at first a British town, and then a *municipium* under the Romans; a term which implies that its inhabitants possessed some of the privileges of Roman citizens. The Roman road, called by the Saxons the Watling Street, was also called Werlaem Street, because it first went direct to Verulam, passing close under its walls. (See Gibson's *Camden*, vol. i. 79.) Verulam was the scene of dreadful slaughter in the great rebellion under Boadicea, who destroyed here and at Londinium (London), and at other places, about 70,000 Roman citizens and their allies. The town was, however, restored, and continued to be a principal Roman station while that people possessed this island. Here an eminent citizen, Alban, is said to have suffered martyrdom in the persecution under Dioclesian. In his honour a monastery for one hundred Benedictine monks was erected in 793 by Offa, king of Mercia, one of the Saxon kingdoms established in Britain.

Ulsinus, or Ulsig, the sixth abbot, may be regarded as the founder of the modern town of St. Alban's; for he (about A.D. 948) erected three churches on the three principal roads leading to the monastery, laid out a place for a market, and encouraged the people of the neighbourhood to build by supplying them with money and materials. In the years 1455 and 1461, during the wars between the rival houses of York and Lancaster, two fierce battles were fought in the neighbourhood of the town;* which must have been growing into considerable importance, as it obtained a charter of incorporation from Edward VI., A.D. 1553, and the elective franchise (which had been very long suspended) was restored before that time.

The town is well situated on the summit and northern declivity of a small hill, the abbey church being at a point where the three principal streets meet. It is well paved and lighted, and has a supply of good water. The part on the old line of the north road (which runs through the town) is narrow, and has many ancient houses. The other parts are more spacious and well built; and the new line of the north road is adorned with neat villas and one of the most commodious inns in the county. The churches are, the Abbey Church, a rectory in the patronage of the mayor and burgesses; St. Peter's, a vicarage in the patronage of the Bishop of Ely; and St. Michael's, which is on the opposite or S.W. side of the Ver, and contains the monument of the great Bacon, who bore the title of Viscount St. Alban's: there are also several dissenting meeting-houses. The grammar-school was founded by Edward VI.; there is besides a Blue-coat school, supported by some property in the funds, and by subscription, for educating about thirty-five boys in the principles of the established church, and clothing them; and also a girls' school, supported by the Grimston family. There are several alms-houses; the principal, called Marlborough-buildings, or simply 'the Buildings,' for thirty-six persons, half of each sex, were built and endowed by Sarah, Duchess of Marlborough. Some remains of the walls of Verulamium are still discernible.

But the principal object in St. Alban's is the abbey church, which is part of the ancient abbey, purchased by the inhabitants of Edward VI. for a parish church, at the price of 400*l.* and a fee farm rent of 10*l.*, which last payment was in 1684 redeemed for 200*l.* The abbey itself had been granted by Henry VIII. to Sir Richard Lee, upon the seizure of the religious houses by that unscrupulous tyrant. The church is built in the form of a cross. It is in length more than 600 feet from E. to W., including a chapel at one end; and the extreme breadth is more than two hundred at the intersection of the transepts. From the intersection arises a square tower, divided by bands into three stages, and crowned by battlements and a spire, both of later date than the tower itself, which is one of the most perfect parts of the building; an advantage which it probably owes to a thick coat of plaister which once covered it. The vast extent of the church gives it an imposing appearance; but the effect is somewhat diminished, upon a nearer approach, by the heterogeneous materials of which it is composed; viz., Roman tiles from Verulam, flints, bricks, &c. The architecture, too, is far from uniform: the pointed arch and the round are to be seen on opposite sides; and, indeed, so great is the variety, that the style of every age may be traced in succession from the time of the Normans to that of Edward IV. The most central parts are the most ancient. The choir is separated from the nave by St. Cuthbert's screen. There is, also, a richly-carved screen over the altar; and several remarkable monuments, including those of Humphrey, Duke of Gloucester, and of the Abbots Ramryge and Whethamsted. The church suffered considerably during the Parliamentary war from the prisoners confined in it, and from the rapacity or zeal of the parliamentary troops. On the 3rd of February, 1832, a part of the wall on the south-west side fell down, and in its fall did considerable injury. This accident having drawn the public attention to the dilapidated state of the building, has led to a subscription for its preservation. The amount required is 15,000*l.*

The gateway of the abbey is still standing; and contains the entrance to the house of correction on one side, and the gaol for the liberty of St. Alban's on the other. The revenue of the abbey at the dissolution is estimated to have been 2510*l.*,*—a large income at that time. The abbot possessed also many privileges, and had a grant of precedence over all other abbots, from Pope Adrian IV. (Nicholas Breakspeare), the only Englishman who ever sat in the chair of St. Peter.

The population of the borough, according to the census of 1831, was 4772; but if the parts of St. Michael's and St. Peter's parishes had been added, which lie beyond the limits of the borough, the population would have been considerably larger. The additions made to the borough by the Boundary Bill, supplementary to the Reform Bill, have increased the population to 5771. The poorer people are chiefly employed in making straw plat, or in a silk-mill and a cotton-mill which have been established here. It has a market on Saturdays; and two annual fairs, one on the 25th and 26th of March, and a cattle and holiday fair on the 10th, 11th, and 12th Oct. There is a statute fair for hiring servants on the 29th Sept.

The borough returns two members to parliament; and is governed by a corporation, consisting of a mayor, high steward, recorder, twelve aldermen, and twenty-four assistants, with a town clerk and subordinate officers. The gaol delivery is four times a-year, the town having a separate jurisdiction. The family of Beauclerc takes the title of duke from this town, and the family of Grimston that of earl from the ancient town of Verulam.

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* In the first of these, Henry VI. fell into the hands of the Yorkists, and in the last was rescued by his wife, Margaret of Anjou.

* So Stow and Speed: 2100*l*, Dugd.

St. Alban's is 20 miles N.W. by N. of London, and 12½ W. by S. of Hertford. [See Chauncy's *Hertfordshire; Newcome's History of St. Alban's; Boundary Reports.*]

ALBANY, LOUISA (Countess of), daughter of Prince Stolberg Gedern, in Germany, was born in 1753, and married in 1772 to Charles James Edward, called the young Pretender, grandson of James II. They resided at Rome, and had a little court, by which they were addressed as king and queen. In 1780, Louisa left her husband, who was much older than herself, and with whom she did not agree, and retired to a convent. She afterwards went to France; but upon her husband's death in 1788, she returned to Italy, and lastly settled at Florence. She was then secretly married to Count Alfieri, the Italian poet, who died at her house in 1803. She, however, went by the name of Countess of Albany, as the widow of the last of the Stuarts, up to the time of her death, which happened at Florence only a few years since. She was fond of literature and of the arts, and her house was resorted to by the most distinguished persons at Florence, natives as well as foreigners. She caused a fine monument to be erected by Canova in 1810, in the church of Santa Croce, to the memory of Alfieri. [See Alfieri.]

ALBANY, a district situated at the eastern extremity of the colony of the Cape of Good Hope in South Africa. This district, which has been recently established, was formerly part of the district of Graaf Reynet.

Albany is bounded on the north and north-east by Caffraria —its natural boundary in those quarters being the Great Fish River. On the east and the south it is bounded by the Indian Ocean; and on the west by other portions of Graaf Reynet—its natural boundary on that side being the Zondag or Sunday River. The length of the district, from west to east, is seventy miles, and its average breadth is about twenty-five miles. It contains, according to the Government survey, 1792 square miles, or about 1,200,000 acres of surface; but little more than 3000 acres of this have hitherto been brought under cultivation. The district was formerly inhabited by the tribe of Ghonaqua Hottentots; but this race, whose numbers are now very much diminished, has retreated into Caffraria, leaving the European settlers in possession of the territory.

The principal stream of the district is the Great Fish River, which rises in the Sneeuwbergen or Snowy Mountains, and falls into the Indian Sea in 33° 30′ S. lat., and 27° 20′ E. long. The Portuguese formed a settlement on its banks soon after 1498, when the commander of their Indian fleet gave his own name to the river, calling it Rio d'Infante. This settlement was soon abandoned, owing, it is said, to the constant and harassing inroads of the natives. The entrance to the river is obstructed by a bar of sand formed at its mouth; but within this, the depth of water is sufficient to float ships of the largest size. A settlement, named Graham's Town, was formed a few years ago on the bank of the river, and has already become a trading-place of some consequence to the colony. The chief magistrate of the district resides in the town. The river next in importance is the Zondag, which likewise has its source in the Snowy Mountains, and which, after flowing through a great part of Graaf Reynet, enters the Indian Ocean at Algoa Bay, formerly known as Zwartkop's Bay, in 33° 56′ S. lat., and 26° 53′ E. long.

A large natural saltpan is situated near to the Sunday River, and to this the inhabitants of the colony resort. The salt is formed in this pan in masses which are from four to five inches thick: that part of the produce which is taken from near to the margin of the pan, where it has been accumulated by the winds, is the most esteemed for its quality. The remaining rivers of the district are not of much magnitude: they are the Bosjesmans, the Karuka, the Kasowka, and the Kowie or Buffalo River.

The bays and inlets along the coast are frequented by abundance of excellent fish fit for curing; and in a more advanced state of the colony, when the market has become more extensive, fisheries will doubtless be established. At present the farmers are in the habit of repairing occasionally to the sea-coast, and of taking and curing a quantity of fish, with which they return home for the consumption of their families.

The general appearance of the country is agreeable, it being diversified by hill and dale, and in many places ornamented by timber trees, so as to wear the appearance of an immense park. Numerous springs and rills are met with in the valleys; and aloes, euphorbias, and some other succulent plants, are commonly found in such situations. The soil in many places produces an abundant spontaneous crop of coarse, sour grass, to which the district owed its old Dutch name of Zuurveldt (Sour Field). It is said that the cereal grains and pulse grown in Europe, as well as most culinary vegetables and artificial grasses, succeed well on the plains; while the slopes of hills are adapted to the culture of the vine. The vineyards and gardens of the district occupied 695 acres in 1831, when 3046 were planted with grain and potatoes, 1495 of which were producing oats.

Lions, wolves, and the Cape leopard, are met with in this district, but are not in sufficient numbers to render them formidable enemies to the settlers: neither are buffaloes to be found in any great numbers; and elephants, which formerly abounded, are now less frequently seen.

The population of the district in 1820 amounted to 1623 Europeans, 566 Hottentots, and 353 slaves; but the encouragement given, about that time, by the British government to emigrants proceeding thither from this kingdom, has occasioned a very considerable increase to these numbers; and the inhabitants were found, at the last census in 1831, to amount to 6416, of whom 6277 were Europeans and free persons of colour—the latter class numbering about 250 souls—and only 139 slaves. The decrease in the latter class is accounted for by the fact, that grants of land have been uniformly made to the settlers on the condition that slaves shall not be employed in cultivating the soil. The district contains four free-schools, supported at the public expense, where 192 scholars were taught in 1831.

The most important part of the trade of Albany consists in the traffic carried on by licensed traders with the native tribes beyond the boundary-line of the colony. This trade is carried on through a very wide extent of country in the Caffre territory, and is conducted in perfect harmony with the natives, whose attention has been successfully directed, not only to increase the quantity, but also to improve the quality of the goods which they give in barter for European productions. The principal articles, procured in this manner, are hides, horns, and ivory, together with a considerable number of live cattle. The sale to the natives of arms, ammunition, and spirituous liquors is prohibited, and such goods are declared liable to seizure as contraband. The raw produce shipped from the district in 1830 was valued at more than 50,000*l*.

The attention of the settlers has been drawn of late to the improvement of their growth of wool; and great hopes are entertained of turning the extensive pastures of Albany to a profitable account in this manner, so that wool may in a few years become the staple production and export of the district.

Some quarries of indurated limestone have been opened between Bathurst and the Fish River. The stone from these quarries is easily worked, and hardens on exposure to the atmosphere. The houses in Bathurst are built of this material, and have a neat and substantial appearance. Some indications of the presence of iron have been met with; and manganese has been seen in various parts of the district.

Some few manufactories are established in Albany; among the rest are six tanneries, a woollen-hat manufactory, numerous grist-mills, a manufactory for blankets and coarse woollen cloths, and two establishments for making candles, of which article shipments are constantly made to Cape-Town.

In addition to Graham's Town, the capital of the district, three towns, or rather villages, have been formed. These are Bathurst, Port Frances, and Salem. *Report of Commissioners of Enquiry upon the Trade, Navigation, and Harbours of the Cape of Good Hope*, printed by order of the House of Commons.

ALBANY, the seat of legislation for the state of New York, is situated on the west bank of the Hudson river, 42° 39′ N. lat., and about 73° 13′ W. long., and about one hundred and forty miles nearly due north from the city of New York. The tide-water rises as far as Troy, which is about five miles above Albany and on the opposite side of the river, up to which place there is a sloop navigation. Vessels of eighty tons ascend as far as Albany; and there is a daily communication between this town and New York by means of steam-boats, except during the severest part of the winter season. The average length of the voyage is from twelve to thirteen hours; but it is said to have been sometimes accomplished in a little more than eleven hours.

The town consists of one principal street, of considerable length, parallel to the river, with other streets, some of which run down to the stream nearly at right angles to it. From the main street the ground rises abruptly, so that the rest of the city is on the side of a hill, and presents a very fine appearance from Greenbush, on the opposite side of the river. The principal building is the Capitol, a stone edifice, which contains the chambers both of the Senate and House of Assembly: it stands on the top of a steep but wide and handsome street, called State Street. Albany contains, also, a state-hall for public offices, an arsenal, a theatre, a prison, and twelve churches. The houses are built of brick and stone; and the older dwellings, with their gables turned to the street, of which we still observe some traces in the city of New York also, indicate the Dutch origin of both places. The principal supply of water to the town is from a source about two miles and a half distant.

Albany, from its central position, is a place of great and increasing trade, forming a kind of natural entrepôt between New York and a vast extent of interior country, comprising the Canadas, part of Ohio, on the one side, and parts of the New England states on the other. The Erie and Champlain canals unite at a place which bears the Dutch name of Watervliet (eight miles north of Albany), and then run in one united channel to the large canal basin at Albany, which is said to cover thirty-two acres. Flour and other agricultural products form the staple of the exports. The following are pretty nearly the population of this town at different periods since the close of the last century:—1800, about 4000; 1810, 9356; 1820, 12,613; 1825, 15,974, and 1800 houses. A company was incorporated, April 17, 1832, to connect New York with Albany by a rail-road terminating opposite Albany on the E. side of the river.

Albany was originally a Dutch fort, erected in 1612 or 1614, called Fort Orange, and is therefore the oldest town in the United States, except James-town, on the James river, which dates from 1607. Somewhat later it took the name of Williamstadt, which it retained till 1664, when the colony fell into the hands of the English. Its present name is derived from James II., to whom, when Duke of York and Albany, Charles II. granted the proprietorship of the colony.

Albany is also the name of the county of which Albany is the chief town. [See Darby's *Geography*; Hall's *Travels in the United States*; Stuart's, &c.; *Encyclop. American.*]

ALBATROSS (*Diomedea*), a genus of web-footed birds, comprising three species,—the albatross of China (*D. fuliginosa*, Latham); the yellow and black-beaked albatross (*D. chlororynchos*, Latham); and the common albatross (*D. exulans*, Linnæus). The genus is principally distinguished by the following characters: a very strong, hard, long beak, which is straight to near the extremity, when it suddenly curves. The upper mandible appears composed of many articulated pieces, furrowed on the sides, and crooked at the point; the lower mandible smooth and cut short; the nostrils lateral, and placed, like small rolls, in the furrow of the mandible; the feet short; the three toes long and completely webbed; the wings very long and narrow. The name Albatross is a word apparently corrupted by Dampier from the Portuguese *Alcatraz*, which was applied by the early navigators of that nation to cormorants and other large sea-birds. Grew wrote the word Albitros, and Edwards, Albatros.

[Albatross, Diomedea exulans.]

The common albatross is the species which is most frequently met with in the seas of Southern Africa. It is the largest sea-bird known. On account of its size and colour it is often called the Sheep of the Cape,—a name under which it is found in several voyages. The top of the head is a ruddy grey; the rest of the plumage is white, with the exception of several transverse black bands on the back, and a few of the wing feathers. The feet and membrane are of a deep flesh colour; the bill a pale yellow.

The weight of this bird has been variously stated from twelve to twenty-eight pounds; and a similar difference appears to exist in authors with respect to the distance between the extremity of the extended wings. Forster says above ten feet,—Parkins, eleven feet seven inches,—Cook, eleven feet; another says twelve feet; a specimen in the Leverian museum measured thirteen feet; and Ives (p. 5) mentions one, shot off the Cape of Good Hope, which measured seventeen feet and a half from wing to wing. Dr. Arnott, in his Physics, says,—'How powerful must be the wing muscles of birds which sustain themselves in the sky for hours together! The great albatross, with wings extending fourteen feet or more, is seen in the stormy solitude of the Southern Ocean, accompanying ships for whole days without ever resting on the waves.'

We can, from this circumstance, readily understand the extensive range in which the albatross is found; not being confined, as Buffon imagined, to the Southern Ocean, but being equally abundant in the northern latitudes, though Forster says he never observed it within the tropics. These birds are seen in immense flocks about Behring's Straits and Kamtschatka about the end of June, frequenting chiefly the inner sea, the Kurile Islands, and the Bay of Pentschinensi, whereas scarcely a straggler is to be seen on the eastern or American shore. They seem to be attracted thither by vast shoals of fish, whose migratory movements the albatrosses follow. On their first appearing in those seas, they are very lean, but, from finding abundance of food, they soon become fat. Their voracity is so great, that they will often swallow a salmon of four or five pounds weight, and then, being half choked, and unable, in consequence, to move, the natives easily knock them down with a stick.

They do not, however, confine themselves to fish, but will prey on any other sea-animal; and Cook's sailors caught them with a line and a hook. The Kamtschadales take them by fastening a cord to a large hook, baited with a whole fish, which the birds greedily seize. Their usual food, however, seems rather to be fish-spawn and small *mollusca*. M. Querhoënt never found in their stomachs anything besides a thick mucilage.

Notwithstanding their strength, they never venture to attack other sea-birds, but are, on the contrary, attacked by the gulls. Several large grey gulls,' says Cook, 'that were pursuing a white albatross, afforded us a diverting spectacle: they overtook it, notwithstanding the length of its wings, and they tried to attack it under the belly, that part being probably defenceless: the albatross had now no means of escaping but by dipping its body into the water; its formidable bill seemed to repel them.'

Their flesh is tough and dry; but the Kamtschadales take them for the sake of their entrails, which they blow and use as buoys for their nets. They employ the wing bones, also, which Edwards says are as long as their whole body, for tobacco pipes.

ALBEMARLE (DUKE OF). [See MONK.]

ALBEMARLE, a county in Virginia, bordering on the east side of the Blue Ridge, and partly watered by the James River and its tributary the Rivanna. It is remarkable for the natural beauty of its scenery and its general salubrity. The University of Virginia, an institution which opened in 1825, and Monticello, the residence of the late President Jefferson, are in this county, and adjacent to Charlottesville, the county town, and the only town. [See CHARLOTTESVILLE.]

ALBEMARLE SOUND is an inlet of the sea on the eastern coast of North Carolina. It is sixty miles in length, and its breadth varies from four to fifteen miles. The waters of the Roanoke and Chowan rivers fall into this Sound, which may be considered as the æstuary of those streams. The first-named of them is navigable for more than thirty miles from its mouth by vessels of considerable burthen; and boats of from thirty to forty tons can proceed to the foot of the Falls, seventy miles from its mouth. The Chowan river is three miles wide at its entrance, but speedily becomes much contracted. Albemarle Sound communicates with the Atlantic by a narrow channel, called Roanoke Inlet, in 35° 50′ N. lat., and 75° 35′ W. long. It has also a communication with Pamtico Sound, which lies to the south, and with Currituck Sound to the north. A navigable canal, cut through the Dismal Swamp, connects the waters of the Pasquotank, which fall into Albemarle Sound, with those of Elizabeth River, whence a communication is obtained with Chesapeake Bay.

ALBERONI (CARDINAL **GIULIO**) was born in the state of Piacenza, in May, 1664. He was bred to the church, and became curate of a country parish. The Duke of Vendôme, who commanded the French army in Italy during the war of the Spanish succession in 1702-4, happening to be in the states of Parma, and being in want of corn for his troops, sent for Alberoni. The curate had become personally known several years before to Campistron, the poet, one of the Duke's followers, when the latter, travelling through Italy, and being stripped by robbers in the same neighbourhood, was kindly taken home by him and his wants supplied. Alberoni, who was a man of natural abilities and quickness, rendered himself useful to the French general; on which account, however, he became obnoxious to the opposite, or imperial party. When Vendôme was recalled from Italy, he took Alberoni with him, and obtained for him a pension of one thousand French crowns from Louis XIV. Alberoni followed the Duke into Spain, where the war was then raging in Catalonia. Vendôme employed Alberoni in his negotiations with the court of Philip V., where at that time the Princess des Ursins enjoyed the greatest influence. Alberoni found favour with the princess, whose intriguing mind was congenial to his own, and he became her confidant. Through her means he was constituted agent of the Duke of Parma at the court of Madrid; in which capacity he was instrumental in bringing about the marriage of Philip V. with Elizabeth Farnese, daughter of the Prince of Parma. He set off for Parma to stipulate the marriage-contract in the king's name. In the mean time, the Princess des Ursins having understood that the character of the future bride was not so mild as it had been represented by Alberoni, and that she was likely to endanger her own influence at court, prevailed on the king to despatch a courier to Parma, with orders to Alberoni to suspend the negotiation. The courier arrived on the eve of the day appointed for affixing the signatures. Alberoni, it was said, by threats or bribe, prevailed upon the man not to make his appearance until the day after. The marriage-contract was signed in December, 1714, and the new queen set off for Spain. The first favour she asked of her husband, in writing, was to dismiss the Princess des Ursins from court. The latter, who had set off from Madrid to meet her, received an order from Philip to quit Spain immediately. The new queen, in gratitude to Alberoni, had him appointed a member of the king's council, Bishop of Malaga, and, lastly, prime minister of Spain. He now devoted all his energies to rouse Spain from the state of weakness into which she had fallen during the preceding century, and make her act a principal part in the affairs of Europe. Alberoni was not scrupulous about means. In violation of the peace of Utrecht, he suddenly invaded the island of Sardinia, which had been secured to the emperor, and afterwards, in like manner, conquered Sicily,—the Duke of Savoy being then at peace with Spain. All Europe was astounded at this new war stirred up by Alberoni: England, France, and the emperor, resented his conduct; and an alliance was formed against Spain in 1719. Alberoni defied them all: he favoured the Pretender, in order to find employment for the English at home; he tried to excite disturbance in France, especially among the Protestants in the south, by claiming for Philip V. the regency of that kingdom during the minority of Louis XV.; and he even corresponded with Ragotski of Transylvania, and with the sultan, in order to divert the attention of the emperor. The latter sovereign was, in consequence, obliged to recall Prince Eugene, in the midst of his successful campaigns against the Turks, and to conclude with the latter a disadvantageous peace at Passarowitz. The clamour against Alberoni, on account of these intrigues, was universal. Pope Clement XI., who had been induced by Philip V. to make Alberoni a cardinal, was loud in his remonstrances against him. The fall of Alberoni was resolved by the allied powers as the only means of restoring peace to Europe. The Duke of Parma was prevailed upon to use his influence with the court of Spain, and especially with the queen, who being already weary of the haughty, overbearing tone of the cardinal-minister, induced Philip V. to write with his own hand an order for Alberoni's deposition, and his banishment from the Spanish territories. This happened at the end of 1719, after Alberoni had been minister about three years. Alberoni repaired to Italy, where he had transmitted large sums of money. Orders had been given by the Pope for his arrest, which Alberoni, however, evaded. A process was instituted, at the same time, against him at Rome, which he also contrived to protract. Pope Clement XI. having died in March, 1721, Alberoni suddenly repaired to Rome to attend the conclave, to the astonishment of the people, who crowded to see this famous personage. The new-elected Pope, Innocent XIII., quashed the proceedings against him.

Some time after, Alberoni was sent as legate to Romagna. But he had not yet totally forgotten his habits of intrigue; and being now unable any longer to disturb the peace of Europe, he contrived to embroil the diminutive republic of San Marino, which unfortunately was placed in the neighbourhood of his government. Under the pretence of remedying some discontents, he entered the town of San Marino, and called upon the citizens to swear allegiance to the Pope. Some ran away, others refused, and the rest complied through fear. The Pope, however, disapproved of Alberoni's conduct, and sent another legate, who reinstated the republican government. This occurred at the beginning of 1740. Alberoni, after this, retired to Piacenza, his native country, where he lived in affluence, and built a large religious house. He remained in retirement, forgotten by the world, till the 26th of June, 1752, when he died at the advanced age of eighty-eight.

Alberoni left a quantity of MSS., from which a work, called his *Political Testament*, published at Lausanne in 1753, was said to be derived. He is remarkable as one of the most prominent examples of that class of statesmen who rose to power by the most pitiful intrigues; and who, being uncontrolled by public opinion, thought their own ambition and their pretended zeal for their despotic masters a sufficient motive to plunge the people of Europe into continual wars, in which they had no real interest; and whose effects have so long retarded the natural progress of mankind in civilization by the efforts of peaceful industry.

ALBERT DURER. [See DURER.]

ALBERT I., Duke of Austria, and afterwards Emperor of Germany, was the son of Rudolf of Hapsburg, the founder of the imperial Austrian dynasty. Albert married the heiress of the former Dukes of Austria. After his father's death in 1291, he assumed the imperial title, in opposition to the votes of the electors, who had chosen Adolphus of Nassau. After several years' war between the two competitors, Albert defeated Adolphus, who was killed in battle in 1298. Albert then ascended the imperial throne, and received, after many difficulties, the confirmation of the Pope Boniface, VIII. He was next engaged in wars with the Bohemians, whose country he attempted to conquer, but without success. Soon after this, the Swiss forest cantons revolted, on the 1st of January, 1308, against Albert's lieutenants, whose government was arbitrary and oppressive: this was the beginning of the Swiss confederation. [See SWITZERLAND.] Albert, full of indignation, came with troops to chastise them: he advanced as far as Baden in Aargau, where he summoned his vassals and held a council for the reduction of the revolted cantons. On the 1st of May, 1308, Albert left Baden to return to Rheinfelden, where the Empress Elizabeth was. As he crossed the river Reuss at Windisch in a boat, he was separated from the greater part of his suite, his nephew, John of Hapsburg, and three other noblemen only, crossing over with the emperor. John, who had lately come of age, had been importunate with his uncle to restore to him his father's estates in Suabia, which Albert seemed determined to keep in his own possession. The nephew, despairing of justice, had formed a conspiracy with the three noblemen already mentioned, and as the party landed on the opposite bank of the Reuss, the conspirators fell upon the emperor and murdered him, in sight of his attendants on the other side of the river, who could give their master no assist ance. Albert expired in the arms of a poor countrywoman who happened to pass that way. The murderers fled; two of them were afterwards taken and executed, as well as a number of other persons, mostly innocent, who were suspected to have been concerned in the conspiracy. Agnes, Albert's daughter, and Queen of Hungary, carried her vengeance for her father's death to a most dreadful extent. Nearly one hundred noble families, and one thousand persons not noble, of every age and sex, were involved in this inhuman proscription. The executions lasted several months. After this butchery, Agnes built a monastery on the spot where Albert had been murdered, which was called *Königsfelden*, and here she shut herself up for the rest of her days. The remains of this monastery and church are still to be seen, as well as the apartments which Queen Agnes occupied. Königsfelden is on the high road from Basle to Baden and Zürich in Switzerland, and in sight of the Castle of Hapsburg, from whence the House of Austria originally sprung.—Johann Muller, *Geschichte der Schweitzer*.

ALBERT II., King of Hungary and Bohemia, and Duke of Austria, succeeded Sigismund as Emperor of Germany in 1438. He held a great diet at Nuremberg, in which the *Vehmic* or secret courts were suppressed. He died the following year, as he was preparing to take the field against the Turks who were ravaging Hungary.

ALBERT, Archduke of Austria, son of the Emperor Maximilian II., was made a Cardinal and Archbishop of Toledo. He was appointed by Philip II., in 1596, governor of the Low Countries, and succeeded the Duke of Parma in the difficult task of carrying on the war against the Dutch, who had revolted from Spain. He resigned the cardinalship and married Elizabeth of Austria, daughter of Philip II., who brought him Flanders and Franche Comté as her dowry: he thus became sovereign, nominally at least, of the Belgic provinces. In July, 1600, he fought the battle of Nieuport against the Dutch under Maurice of Nassau: this engagement, in which Albert was defeated, decided the independence of Holland. Albert next besieged Ostend, which he took after a long and murderous siege, in which one hundred thousand men are said to have lost their lives on both sides. In 1609, Albert concluded a truce with the Dutch for twelve years, before the expiration of which he died, in 1621. He left no children; and the dominion of Flanders reverted to Spain.

ALBERT, Prince of Mecklenburg, was called to the throne of Sweden in 1364, by the nobility who had deposed King Magnus. The partisans of the latter, joined with Haquin, King of Norway, carried on the war for several years; at last Magnus formally gave up the crown to Albert in 1371. Waldemar, King of Denmark, dying in 1376, his daughter Margaret, widow of Haquin, King of Norway, became queen of both Denmark and Norway, and soon after the Swedes, being dissatisfied with Albert, who favoured his German countrymen at their expense, offered to Margaret the crown of Sweden. After several more years of war, a decisive battle was fought at Talkoping in West Gothland, in which the queen's forces defeated Albert, and took him prisoner in 1388. Peace, however, was not re-established in Sweden till 1395, when Albert consented to give up his claims to the crown. He then retired into Mecklenburg, where he died. Margaret of Waldemar thus united the three northern kingdoms under one sceptre.

ALBERT, Margrave of Brandenburg, and first Duke of Prussia, was born in 1490. He was elected, in 1511, Grand Master of the Teutonic order, who held dominion over Prussia proper, that part of the present kingdom of Prussia which borders on the Baltic Sea. He fought against Sigismund, King of Poland, for the defence of his order, who had been for ages at war with the Poles. Peace was made in 1525 at Cracow, in which Albert managed to have the duchy of Prussia secured to himself and his descendants as a fief of the crown of Poland, thus laying aside the rights of the order. Albert some time after embraced the Protestant faith, and married a Princess of Denmark. One of his descendants, Frederick William, elector of Brandenburg, threw off the allegiance of Poland, and his son, Frederic I., changed the title of duke into that of King of Prussia in 1701. [See BRANDENBURG.]

ALBERTI, (LEON-BATTISTA,) a distinguished mathematician, but more celebrated as an architect, and hardly less so as a philosopher, poet, painter, and sculptor. He was of the ancient and noble family of the Alberti of Florence, in which city he was born about the year 1400,—Milizia says, in 1398. He was nephew of the Cardinal Albert of the Alberti, and he himself became a canon of the metropolitan church of Florence, having adopted the clerical profession it is understood, that he might have leisure to give himself up to useful learning. To his father Lorenzo, (Laurence,) he was indebted for great care and attention in his education; and hence study became so much the habit of his life, that he is said never to have spent an hour in idleness, nor even to have passed a day without reading. Having devoted much of his attention to the acquisition of the principles of architecture, by the observation and admeasurement of the remains of ancient edifices in various parts of Italy, and the study, it may be presumed, of the writings of Vitruvius, Alberti became distinguished among the promoters of the then new style, which has been called a restoration of the ancient and classical. This he practised in all the works on which he was employed, but not always with the effect which the admirers of the style require. When at Rome, Alberti was employed by the then Pope, Nicholas V., to repair the ancient aqueduct of the Aqua Vergine, and to construct the fountain in which one of its conduits issues. This is the great Fontana di Trevi, which stands at the foot of the Quirinal; but the structure was so much decorated by Salvi in the pontificate of Clement XII., that not a vestige now remains of the design of Alberti, or of its former simplicity. It is understood that Alberti was commissioned by Pope Nicholas to rebuild the Vatican Basilia, but that he had hardly commenced his preparations for the construction of an immense tribune, beyond the upper end of the ancient structure, when the pope died, and the undertaking was for that time abandoned. For the same pontiff he had made a design for covering the bridge of St. Angelo, so as to protect those who passed over it, in their way to and from St. Peter's, from the intense heat of the sun; but it was never carried into execution.

At Florence, Alberti succeeded to the direction of several works which had been commenced by Brunelleschi and left unfinished at his death. He designed and executed in Florence, of himself, the Palazzo Rucellai, the choir and tribune of the church of the Annunciation, which latter he made in the manner of an ancient circular temple; and some attribute to Alberti, but, it would appear, without sufficient reason, the principal front of the church of Sta. Maria Novella. At Mantua, for the Duke Lodovico Gonzaga, he executed several edifices; the most important and most meritorious of which was the church of St. Andrew, the interior of which, however, has been very much injured by later alterations and additions. But the most esteemed architectural work of Alberti is the church of St. Francis at Rimini, which he was employed to decorate by Sigismondo Malatesta, lord of that city. This he did by removing, as much as he could, the picturesque peculiarities of a fine old church of the middle ages, and substituting the commonplaces of the Italian style of his time in their stead.

At the early age of twenty, Alberti had composed the comedy *Philodoxios*, in which he imitated the style of the Latin comic poets so nearly as to impose upon Aldus Manutius, the younger, who himself edited, printed, and published it, as from an original and recently-discovered manuscript. Alberti tried to introduce the Latin rhythmus into Italian poetry, but did not succeed. He wrote a work on sculpture—*Della Statua*—which was followed by another on painting—*De Pictura*—which he calls '*prædilectissimâ et nunquam satis laudatâ arte*; but his last and most esteemed work is his treatise on architecture, *De Re Ædificatoria*. This was not published until after his death, when it was edited by his brother Bertrand, and, at his own desire, dedicated to Lorenzo de' Medici, who had been his kind and constant friend in life. Milizia says of it, that 'it is a work excellent for architects, though overloaded with useless erudition.'

Alberti was highly estimable as a man and a member of society. He is reported to have been amiable and generous; to have never disagreed with his competitors, because he did not dispute for profit with them. He lived peaceably, esteemed as his merit deserved, and died in his native city at an advanced age, though the exact period of his death is not known. The monument of his family yet exists in the church of the Holy Cross (*della Santa Croce*) in Florence, under which it is probable that he too lies buried.

ALBERTUS MAGNUS, so called because his family name was *Groot*, which, in Dutch, means 'great.' The admiration of an ignorant age transformed into a laudatory epithet the sirname, which had been latinized in conformity to the then prevailing fashion. He was born in Suabia in 1205, and entered the order of Dominicans. Pope Alexander III. invited him to Rome and bestowed on him several dignities, with the bishopric of Ratisbon, which he afterwards abdicated, and returned to live at his convent at Cologne as a plain monk. He there gave public lectures which were much frequented by the principal scholars of the age. Thomas Aquinas was among his disciples. Pope Gregory X. called him to the general council held at Lyons in 1274, where several important decrees were passed for the reformation of the church, and concerning the future elections of popes, for which purpose the conclave or council of cardinals was then first instituted. Albert died at Cologne in 1282, aged 77 He was a most prolific writer; his works, collected and published at Lyons in 1651, fill twenty-one thick folios. But most of these have been long since forgotten. His physics were taken chiefly from Aristotle, and his Arabian commentators. The *Historia Animalium* is, perhaps, the most remarkable for the time in which Albert lived, and he seems to have had access to ancient authorities which have since been lost. Several prodigies have been absurdly attributed to Albert, among others, that of having constructed a head of brass which had the faculty of answering questions. There are also collections of supposed *secrets*, which have erroneously been published under his name; among others, one, *De Secretis Mulierum et Naturæ*, printed at Amsterdam in 1655, which is believed to have been written by one of his disciples.

ALBIGENSES, a religious sect which appeared in the South of France in the twelfth century, and was the object of long and cruel persecutions and wars. The denomination of Albigenses has been used by historians and other writers in two senses, and often indiscriminately. In its more restricted and appropriate sense, the Albigenses were a branch of the Cathari, who were themselves the descendants of the Paulicians, a branch of the Manicheans, from the East; and who, being persecuted by the Greek emperors and clergy, took refuge during the eleventh century in Italy, from whence they spread into the South of France, Spain, and other countries. They were called, in Italy, Cathari, or *pure*; also Paterini, from a place in Milan where they held their meetings; and Gazari, from Gazaria or Lesser Tartary, the country from which they came; they were called, in France, Bulgares for a similar reason; and afterwards Albigenses, from Albiga, Albi, the town where their tenets were condemned by a council in 1176. But the Cathari were divided into two sects, one of which held the old Manichean doctrine of two eternal beings, one the God of Light, who was also the Father of Jesus, and the other, the Principle of Darkness, who was the creator of the material world. This sect was also called Albanenses. The other division of the Cathari believed in one eternal principle, the Supreme God and Father of Christ, by whom the *first matter* was created; until the *Evil Being*, after his rebellion against God and his subsequent fall from heaven, arranged this original matter according to his own fancy, and gave it its present form and attributes. They believed that human bodies in particular were the production of the evil principle. The Albigenses belonged to this latter sect, which was also called Bajolenses or Bagnolenses. They had bishops, vicars, and deacons; they preached abstinence, mortification, and celibacy; their community, however, was divided into two classes, the *Consolati*, or comforted, who lived in perpetual celibacy, abstained from meat and wine, and practised other austerities; and the *Confederates*, who, being unable to endure this mode of existence, lived apparently like the rest of the world, but bound themselves to enter before their death into the class of the 'Comforted,' by a ceremony of inauguration. But, in the more extended sense, the name of Albigenses was given in the twelfth and thirteenth centuries, not only to all the Cathari indiscriminately, but also to the other sects which existed in the South of France at the time, including the Waldenses, who were very distinct in their tenets from the others, and had no taint of Manicheism in them. They all agreed, however, in considering the authority assumed by the Popes in spiritual matters, as well as the discipline and ceremonies of the Roman Church, as unlawful and erroneous. Pope Innocent III. sent two legates, Peter of Castelnau and one Rainier or Raoul, both Cistercian or Bernardine monks, as his legates to France, in order to extirpate all these heresies. Dominic, a Spaniard, and the founder of the order of Preachers, returning from Rome in 1206, fell in with the legates, and volunteered his services in the same cause. These champions, who, without asking for the advice or the concurrence of the local bishops, and upon the sole authority of the Pope, inflicted capital punishment on those heretics whom they could not convert by argument, were called, in common discourse, *Inquisitors*; but the famous tribunal of that name was not established until 1233 by Gregory IX., who entrusted it to the Dominicans. In 1208, Castelnau, one of the legates, who had become odious by his severities, was murdered near Toulouse; and Innocent III. on this proclaimed a regular crusade against the Albigenses, and against Raymond VI., Count of Toulouse, who supported them. All the French barons were summoned to take the field; and Simon, Count of Montfort, was appointed chief of the expedition, under the direction, however, of Arnald, Abbot of the Cistercians, and the Pope's new legate. The war began in 1209, and lasted many years, attended by circumstances of the greatest ferocity. At the taking of Beziers a general massacre of the inhabitants began. The legate being asked by some of the military leaders how they were to distinguish the Albigenses from the orthodox Catholics, of whom there were many in the town,—'Kill them all,' was the reply; 'God will find out his own.' Montfort lost his life at the siege of Toulouse, in 1218, and Raymond, his adversary, died in 1222. The war, however, was resumed by the sons of the two antagonists; until Pope Honorius III., alarmed at the successes of Raymond VII., induced Lewis VIII., King of France, to take the field in person. At last the Count of Toulouse, pressed on all sides, made peace with the king in 1229. This was a mortal blow to the Albigenses. The Inquisition was now permanently established at Toulouse to try those heretics who had escaped the sword. Raymond himself died some years after; and in him the house of the Counts of Toulouse became extinct, and its territories reverted to the French crown. The extermination of the Albigenses in the South of France was complete; the country was devastated; and the language and poetry of the Troubadours became also extinct, the bards themselves being obliged by the terrors of the Inquisition to fly to other lands. Langlois, a Jesuit, has written a History of the Crusade against the Albigenses; but the best account of them is found in the *General History of Languedoc*, published at Paris in 1730. (See Mosheim, *Ecclesiastica. History*, thirteenth century, part ii.)

ALBI'NOS, a word of Portuguese origin, by which the Portuguese voyagers denominated the white negroes whom they found on the coast of Africa. These negroes were also termed *Leucæthiopes*,—a term signifying white negroes. Both names are now used, but the former popularly, to designate individuals who exhibit characters similar to those observed in the white negroes, among whatever race or in whatever country the variety may arise.

These singular beings are distinguished from other individuals of the human race by remarkable characters, which are invariably the same among whatever people or under whatever external circumstances the variety is found. Their most striking peculiarities consist in the colour of their skin and in that of their hair and eyes.

Their skin is of a pearly whiteness, without any admixture whatever of a pink or a brown tint. In the snow-white skin of the fairest European woman there is always some tint of a pink or brown colour, but in the Albinos the skin is wholly destitute of either tinge, and is of a dull pearly whiteness. It is often not soft and smooth in proportion to its whiteness, as is generally the case with the blonds of the European race; but, on the contrary, is rough, dry, and harsh, sometimes to such a degree that it has been compared to the skin of persons labouring under the disease called *lepra*, or leprosy.

The whiteness of the hair always corresponds to the whiteness of the skin. Not only the hair of the head, but also that of the eyebrows, eyelashes, beard, and even the soft down that covers the external surface of the body, has the same unnatural whiteness. And this whiteness of the hair is not like the soft, snowy whiteness of the hoary hair of old age, and still less like the delicate yellow or flaxen tint of the fair-haired European woman, but is rather like that of the white horse.

With this whiteness of the skin and hair is connected a still more striking peculiarity,—namely, a disagreeable redness of the eyes. That part of the eye called the iris is of a pale rose colour, while the pupil is intensely red: in a word, the eye is exactly similar to that of the white rabbit and the ferret

In all persons there is a correspondence between the colour of the skin and that of the hair and eyes; and the close connexion of those parts, in regard to colour, is strikingly illustrated in the Albino,—in whom the colouring principle common to them all is absent, and in whom this deficiency of colour is never found in one of these parts singly.

Some inconvenience certainly arises from the conformation of the eye peculiar to the Albinos. A strong light cannot be borne, and even the full glare of day appears to excite some degree of uneasiness. Hence the eyelids are usually more drawn over the ball of the eye than is common with other persons, and the eyes are generally weak, tender, and watery; while vision is more agreeable and more perfect in twilight. But the inconvenience of an ordinary degree of light, and the advantage of imperfect darkness, have been exaggerated.

The physical, intellectual, and the moral qualities, associated with this singular conformation of the body, have not been stated with distinctness and accuracy. It would seem that the Albino is both physically and mentally somewhat weaker than other men. All accounts agree in representing his physical strength as inferior to that of persons of the ordinary conformation. Saussure, in his *Voyage dans les Alpes*, expressly states, in relation to two boys whom he examined with much attention at Chamouni, that, when they were of a proper age, they were unable to tend the cattle like the other children; and that one of their uncles maintained them out of charity, at a time of life when others were capable of gaining a subsistence by their labour. Wafer, the old voyager, in his account of the Indian Albinos in the Isthmus of Darien, while he represents them as being as nimble in the moonlight as the other Indians, states that they are not so strong and lusty. But in what degree their intellectual powers are confined, or whether indeed there be any decided inferiority, we have at present no means of forming an accurate judgment.

It would seem that there is a greater tendency to the formation of this variety in some parts of the world than in others. It is more common among the African and the Indian tribes than among the European people. In the Isthmus of Darien, and in some of the oriental islands, it is so frequent that some writers have conceived that those persons form a distinct and peculiar tribe; but for this opinion there is no foundation. Mr. Bowdich, however, states that the king of Ashantee, who seems to have considered persons of this description as a great curiosity, and to have indulged his taste for collecting them in a truly oriental manner, had assembled about him nearly a hundred white negroes. Blumenbach states that he has himself seen sixteen Albinos in various parts of Germany; and examples have been not unfrequently found in Denmark, England, Ireland, France, Switzerland, Italy, the Grecian Archipelago, and Hungary[*]. It is common in both sexes, but it would appear to be somewhat more frequent in males than in females.

In order to form a just conception of the anatomical conditions on which the peculiar character of the Albino depends, it is necessary to understand the structure of the skin, and in part, also, that of the eye. The human skin is composed of three distinct parts, the *cuticle*, or the scarf skin; the *cutis vera*, or the true skin; and a third substance interposed between these two parts termed the *corpus* or the *rete mucosum*. The cuticle or the scarf skin is the external covering of the body. It is commonly conceived to be altogether destitute of blood-vessels, nerves, and absorbents; that is, it is supposed to be wholly insensible and inorganic; while the cutis vera or the true skin is highly organized, abounding with blood-vessels, nerves, and absorbents, and is acutely sensible. The cuticle then is an insensible covering or sheath, every where spread out over the exquisitely sensible cutis in order to defend the latter, and to soften and modify the impressions made upon it by external bodies. Now among all the varieties of the human race in all climates, both the cuticle and the cutis are colourless, or nearly so; but there is interposed between them the substance already mentioned under the name of the corpus or the rete mucosum, on which the colour of the body depends. This substance is not distinguishable as a distinct body in the European and the other white varieties of the human race; at least the most careful anatomists declare that, with all the pains they have taken to discover it, they have been unable to demonstrate its existence. But in the Negro, the Caffre, the Malay, and so on, the existence of this substance as a distinct body is clearly demonstrated. In these tribes it assumes the form of a black or exceedingly dark membrane interposed between the cuticle and the cutis. This membrane is about as thick as the cuticle itself and even thicker in the Negro, and its colour is darker on the surface next the cutis than in that next the cuticle. By dissection, especially when aided by a slight degree of putrefaction, it is easily separated both from the cuticle and the cutis. It is this membrane which is termed the rete mucosum, and it is this which is the seat of the different shades of colour of the human race. It is composed of a delicate cellular tissue containing a dark substance on which its colour depends. Every variety of tint with which the human skin is dyed, whether it be white, yellow, red, brown, or black, and every intermediate shade of colour, from the snowy whiteness of the most delicate European female to the deep ebony or jet black of a Gold-coast Negress, depends on the darkness or the lightness of the colouring matter contained in the rete mucosum. Now in the Albino, this substance, if it exist at all, is wholly destitute of colouring matter, and hence the dull pearly whiteness of the skin. The colour of the hair is generally admitted to depend on the colour of this same rete mucosum; and hence, when this membrane is wholly deprived of colour, the hair is reduced to its simple organic ground work, and is also destitute of colour.

But the peculiar redness of the eye is owing to the absence of the colouring matter from certain membranes of the eye. The posterior surface of the iris, and the surface of the membrane of the eye termed the choroid coat, are both, in the natural state, covered with a dark-coloured pigment termed the *pigmentum nigrum*. The blood-vessels that enter into the composition of the iris and the choroid membrane are exceedingly numerous; but when the eye is natural, these blood-vessels are concealed by the black pigment of which we have just spoken. When, however, this pigment is absent, there is nothing to conceal these vessels from the view; they are soon filled with red blood, and they are so numerous as to give to these parts of the eye the appearance of intense redness. In the Albino, the colouring matter of the eye, like that of the skin, is wholly absent, and the eye appears intensely red because the blood-vessels of the most highly vascular part of the organ are left entirely naked and exposed to the view.

Such is the modification of the organs so singularly affected in this curious variety of the human species. But of the cause of this peculiar affection of the organs in question we are wholly ignorant; and the speculations of Buffon on this subject afford a striking example of the absurdities into which men, even of acute minds, fall when they substitute conjecture for investigation, or deem it consistent with the spirit of philosophy to place trust in fancy, when they are without knowledge. Thus, assuming that white is the primitive colour of nature, he says, that this colour may be varied by climate, food, and manners, to yellow, brown, or black; that these colours may, under certain circumstances, return to the primitive colour, but so much altered, that it has no resemblance to the original whiteness, because it has been adulterated by the causes that have been assigned. Nature, he tells us, in her most perfect exertions, made men white; and this same nature, after suffering every possible change, still renders them white; but the natural or specific whiteness is very different from the individual or accidental. It is useful, occasionally, to recur to what was formerly considered, and is still sometimes considered, as an explanation of the phenomena of nature.

Some writers represent the peculiarities which distinguish the Albinos as altogether the result of disease. They found this opinion on the roughness and harshness of the skin, on the tenderness of the eyes, and the comparative physical weakness of these individuals. But the harsh and almost leprous appearance of the skin, though sometimes found, is by no means universal; the tenderness of the eyes arises from the increased sensibility of the organs in consequence of the abstraction of the dark-coloured substance by which, in the natural state, they are defended from the light; and, even admitting it to be a fact, which, however, does not appear to be fully established, that these persons are physically weaker than other men, it would not follow that this weakness is the result of disease. As far as can be judged from external appearance, and from their accounts of their own feelings, the white Negroes appear perfectly healthy; and we know that European Albinos exhibit not a single mark of any disease whatever. It is also certain that domestic animals which exhibit varieties perfectly analogous to those of the human Albinos are free from disease, as is familiarly known with respect to the sheep, pig, horse, cow, dog, cat, rabbit, &c.—for the Leucæthiopic constitution occurs both in domestic and in wild animals: it has been observed not only in the sheep, pig, horse, &c. but also in the mouse, ferret, monkey, squirrel, rat, hamster, guinea-pig, mole, opossum, martin, weasel, roe, fox, rhinoceros, elephant, badger, beaver, bear, camel, buffalo, and ass; and even in the crow, blackbird, canary-bird, partridge, common fowl, and peacock. It is remarkable, however, that it has never been seen in any cold-blooded animal. In all the mammalia and birds just enumerated, the nature and characters of the deviation seem to be perfectly analogous to those of the human Albino. The pure whiteness of their skin and other integuments, and the redness of the iris and pupil, mark the same deficiency of colouring matter. A white mouse, possessed by Blumenbach, exhibited the same inability to bear the light which has been observed almost universally in the human examples: the animal kept its eyelids closed even in the twilight.

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[*] *See Lawrence's Lectures on the Natural History of Man, &c.*, p. 288.

ALBI'NUS (BERNARD SIEGFRIED), one of the most celebrated anatomists of the eighteenth century, was born at Frankfort, in the year 1697. He gave early promise of extraordinary ability which he did not disappoint in his riper years. From his father, who was professor of the practice of medicine in the University of Frankfort, but who subsequently filled the chair of anatomy at Leyden, then the most celebrated school of medicine in Europe, his son imbibed a taste for the art which he afterwards pursued with such splendid success. The position of his father afforded him the advantage of studying from his early youth under the greatest masters of the age—Boerhaave, Ruysch, and Rau—and after completing the usual course of education at Leyden at a very early period, he visited France, where he formed an intimate acquaintance with Winslow and Senac. So well did he avail himself of these opportunities of acquiring knowledge, that his attainments gained him the respect and friendship of each of these eminent men, and by their influence, and more especially by that of Boerhaave, he was elevated, at the age of twenty, to the anatomical professorship of Leyden. This chair he occupied without interruption and with extraordinary celebrity for the space of half a century. He is said to have taken great pains with his lectures, and to have possessed the happy art of communicating whatever knowledge he possessed in a clear and interesting manner to his pupils. He was a most laborious and indefatigable dissector; and excelled in making anatomical preparations, and especially in the art of injecting, the mode of performing which he had probably learned from his master Ruysch. But the circumstance by which he was most distinguished was the application of painting to the illustration of anatomy. When not occupied in teaching, his hours were devoted to the careful dissection of different parts of the body, the faithful representation of which he secured by engaging the most excellent painters that he could procure, and by constantly superintending and directing their drawings. In this manner he obtained admirable drawings of the muscles and bones of the human body, the arteries and veins of the intestines, and the bones of the fœtus. But though he surpassed all other anatomists in the description, no less than in the delineation of the bones and muscles, and added much to anatomical science by the originality of his observations, yet he did not disdain to edit the works of his illustrious predecessors, but published correct and elegant editions of the works of Harvey, the *Anatomy* of Vesalius, and of Fabricius of Acquapendente, and the fine *Anatomical Plates* of Eustachius. By this means he directed the attention of his contemporaries to what was most valuable in the labours of those who had preceded him in his favourite pursuit. The circumstance most to be regretted in his public life was the bitter controversy in which he engaged, respecting a claim to a discovery to which neither was entitled, with the illustrious Haller, who had been his domestic pupil. The field of science is not yet wholly free from contention and strife; but it is gratifying to observe that in the present day among the cultivators of philosophy, in all its departments, there is no example of such rancorous hostility as was frequent in a former age. (For a list of the works of Albinus, see Watt's *Bibliotheca Britannica*, vol. i. p. 14, *z*.)

ALBION, the oldest name by which the island of Great Britain was known to the Greeks and Romans. Great Britain and Ireland were known by the general appellation of the Britannic Islands, while the former was designated by the particular name of Albion or Alwion, and the latter by that of Ierne, Iouernia, or Erin. Cæsar does not use the word Albion: his name for England is Britannia. Pliny says (iv. 16), 'the name of the island *was* Albion, the whole set of islands being called Britannic.' The word *Albinn* is still the *only* name by which the Gaels of Scotland designate that country; and the word signifies in the Gaelic language *white* or *fair* island. The word *alb* itself is not now in use in the Gaelic, but is probably the same root that we find in the Latin adjective *alb-us*, and in the word 'Alps.' *Alb*, however, is found in Armstrong's Gaelic Dictionary. The termination *i*, *inn*, or *innis*, signifies 'island.'

The name of 'Albion' was probably given to England by the Gaels of the opposite coast, who could not fail to be struck with the chalky cliffs that characterize the nearest part of Kent. Settlers from Gaul probably came over to Britain; and their descendants, as we presume the Gaels of Scotland to be, though now confined to the northern part of the island, still retain among them the name of Albinn, by which the whole country was once designated. [See ENGLAND. See *Thoughts on the Origin, &c. of the Gael*, by James Grant, of Corrimony. Armstrong's *Gaelic Dictionary*.]

ALBION, NEW. This name was given by Sir Francis Drake to the entire province of California and part of the adjoining north-west coast of North America, which he visited in the month of June, 1579. The part of this coast now known as New Albion is less extensive, and is limited, by Humboldt and other modern geographers, to that portion of the country which is situated on the mainland, between 43 and 48 degrees of north latitude.

After Drake's visit, this region remained for a long time unexplored. Cook was there during his third voyage in 1778; but it was not until April, 1792, that the coast was minutely surveyed by Vancouver. The part of the country inland, which was most particularly described by this navigator, was in the neighbourhood of Port Discovery, in the supposed strait of Juan de Fuca, and the position of which is stated by Vancouver to be in 48° 7′ N. lat., and 122° 40′ W. long. He represents this country as being of a moderate height near to the shore, but bounded on the east by mountains covered with snow, to which the land from the water's edge rises in a pleasing diversity by hills of gradual ascent, covered with pines to their very summits. The soil he found to be, for the most part, a light sandy loam, in several places of considerable depth, and abundantly mixed with decayed vegetables. The forest trees, which appeared to grow very luxuriantly, consisted principally of silver pines, the Turamahac and Canadian poplar, arbor vitæ, common yew, black and common dwarf oak, American ash, common hazel, sycamore, sugar maple, mountain and Pennsylvanian maple, American alder, and common willow. These trees were for the most part encumbered with a luxuriant growth of underwood. Vancouver considered that the country was capable of high improvement in an agricultural point of view. The spontaneous productions, which he found in the vicinity of the woods, were nearly the same and were growing in equal luxuriance with those under a similar parallel in Europe. He found but few esculent vegetables; the white or dead nettle and samphire were most common: he likewise observed the wild orache, two or three sorts of wild peas, and the common hedge mustard. The two last-mentioned species were found to be excellent of their kind. He likewise gathered some gooseberries and roses.

The only living quadrupeds seen, were a black bear, two or three wild dogs, a few rabbits, several small brown squirrels, rats, and mice, and the skunk, the effluvium from which is described as being most intolerably offensive. Aquatic birds were seen on the coast in great numbers. Among them were some species of the tern, the common gull, the sea-pigeon of Newfoundland, curlews, sandlarks, shags, and black seapies, like those found on the coasts of New Holland and New Zealand. The number of birds in the woods was not great: a few spruce partridges were seen, and of smaller birds but very few either in number or variety of species. Some considerable numbers of white headed and brown eagles, ravens, crows, American kingfishers, and woodpeckers, were observed about the water-side; and a bird, with light-brown plumage, of the crane or heron species, was frequently seen; its eggs, which were considerably larger than those of a turkey, were of a bluish cast and had a pleasant taste. These birds, whose bodies were about the size of the largest turkey, were not less than four feet high when standing erect. Some blue and some nearly white herons of the common size were also seen.

Only a few reptiles were observed, and none of them were troublesome. A small common black snake, a few lizards and frogs, together with a variety of common insects, were the only animals of this description noticed.

The mineral productions generally found were iron ore, quartz, agate, common flints, and compounds of siliceous, with calcareous, magnesian, and argillaceous earths.

The native inhabitants of the coast are not numerous. They adorn their persons with paint, in the same manner, but not to so great a degree, as the inhabitants of Nootka, whom they much resemble in their general appearance. Some few of those seen by Vancouver wore dresses made with bark, others were dressed in the skins of animals, of the species usually found in the north-west part of North America, while the greater number were clad in woollen garments, —and the whole were made with a considerable degree of neatness. These people further showed their desire of considering their personal appearance by their fashion of wearing the hair, which was generally combed and tied behind.

Their spears and arrows were fashioned similarly to those of the inhabitants of Nootka: they were generally barbed and pointed, sometimes with flint, agate, or bone, but more commonly with thin flat iron. It is remarked as an extraordinary circumstance by Vancouver, that, in their purchases, they were more ready to part with weapons pointed with iron, than with others. Their bows were all made of yew, and of superior construction. They were strengthened, some with a strip of an elastic hide, others with the skins of serpents, neatly and firmly affixed to the wood by means of a cement, the adhesive property of which is described as being so great that it is impossible to effect a separation between the two substances without destroying both. This cement is not affected by either damp or dry weather. The bowstring is made of the sinews of marine animals.

The inhabitants do not remain long in any one spot. Several deserted villages were seen, the huts being made of a few crossed sticks, which could be covered with mats; and these latter the natives easily carried with them in their migrations.

These people have a curious method of disposing of their dead, by depositing the bodies of adults in canoes, and those of children in baskets, which are then suspended between two trees, about twelve feet above the ground. In some of the baskets were found small square boxes containing food. It is probable that the course thus described is followed only with the bodies of persons of consideration among the tribes, as great numbers of skulls, ribs, &c., of human bodies, were seen promiscuously scattered about the shore. Some bodies were found, which appeared to have been then recently deposited in the earth, and slightly covered over; rendering it probable that the bones found on the beach had originally been thus deposited, and had become uncovered by the washing of the sea.

The natives were uniformly civil and friendly in their deportment to their European visiters, without manifesting the least sign of fear or suspicion. Their language is said to be wholly different from that spoken by the inhabitants of Nootka.

Port Discovery, already mentioned, is a perfectly safe and convenient harbour, with exceedingly good holding-ground, and free from rocks, but rather deep. It is a mile and three-quarters wide at the mouth, and ten or eleven miles long. The entrance is formed by low, projecting points, extending on each side from high woodland cliffs, and corresponding with points proceeding from an island lying off the mouth of the harbour, and to which, from its position, Vancouver gave the name of Protection Island. A stream of very fine water discharges itself into the harbour about five miles from its mouth. (Vancouver's *Voyage.*)

ALBOIN, one of those northern princes who established kingdoms in Italy upon the ruins of the Roman empire. He was the son of Audoin, king of the Lombards, (see LOMBARDS,) one of the bravest, the most proud, and the most free of the German nations. Tracing their origin from Scandinavia, they were settled, at the time of which we speak, about the middle of the sixth century, in Pannonia. Here they became engaged in hostilities with the rival monarchy of the Gepidæ; and in the early stage of this contest, Alboin, then a youth, signalized his courage, strength, and skill in arms, and the prince of the Gepidæ fell by his hand. After his accession to the Lombard throne, he became enamoured of Rosamond, daughter of Cunimond, king of the Gepidæ, and brother of her whom he had slain, and sought her in marriage. His suit being rejected, he carried her off by force. War in consequence broke out afresh; and the Gepidæ, supported by a Roman army, were strong enough to compel the restoration of the princess. But the love or resentment of Alboin led to the renewal of hostilities: he obtained the assistance of the Avars; the Romans abandoned the Gepidæ to their fate; they were defeated with great slaughter (A. D. 566), and their name and nation passed away. Cunimond fell by the hand of Alboin, and Rosamond became the bride of the victor; whose savage temper led him to fashion the skull of the deceased monarch into a drinking-cup, long preserved as a trophy by the Lombard princes.

In the year 568 Alboin led the Lombards into Italy. Narses, the imperial general, long the protector of Italy and scourge of her northern invaders, is reported to have invited him to this step. Be this as it may, the death of Narses removed the man best qualified to oppose such an enemy; and when Alboin crossed the Julian Alps (the Tyrol), he overran the whole inland district of Italy, to the gates of Rome and Ravenna, without meeting with an army in the field. Milan opened its gates on the 4th of September, 569. Before Pavia he was detained more than three years; and in anger he vowed to put all the inhabitants of every age and sex to the sword. The city yielded at length to famine. As he entered the gate his horse fell and could not be raised again from the ground; and the humanity of one of his attendants, who interpreted this accident as a token of Heaven's wrath against his bloody design, induced him to countermand the intended massacre. Delighted with the situation, he fixed his abode at Pavia, and it remained for some ages the chief city of the Lombard dominions.

By the justice and mildness of his government, Alboin secured the affections of his people; and it is possible that, had not his reign been limited to the short space of three years and a half, he might have mastered the whole peninsula. The conquest of the Lombards was in some sort the epoch of the regeneration of the people. Independent principalities, communities, and republics began to be formed on all sides; a principle of life was infused into the country, which had been so long buried in lethargic slumber. The series of monarchs who succeeded Alboin were long distinguished by their prudence, and by making the laws their rule of conduct.

Alboin's life was terminated by domestic treachery. Having drunk deep at a feast with the chief of his countrymen, he called for the cup of victory, the skull of Cunimond; and when it had passed round the circle, ordered it to be carried to Rosamond, with his request that she would taste the wine, and rejoice with her departed father. The queen obeyed, but she determined on revenge. One evening, when Alboin, oppressed by wine and sleep, had retired to his chamber, she unbolted the door to her paramour, the king's armour-bearer, after she had herself fastened his sword to the scabbard. Alboin was the best and bravest of the Lombard warriors; but, unarmed and surprised, he fell an easy victim. His valour, generosity, and successes were celebrated in the songs of the German nations even to the age of Charlemagne. Paul Warnefrid, *De Gestis Langobardorum.*—Muratori.—Gibbon, chap. xlv.

AL BORAK, the name of an imaginary animal, on which, according to the Mohammedan tradition, the Arabian prophet performed his journey from the temple at Jerusalem through the heavens. It is conceived by them to have been of a middle stature and size, between that of a mule and of an ass, and to have received its name in allusion to the shining whiteness of its colour.

ALBORNO'Z, GIL CARRILLO DE, was born at Cuenca, about the beginning of the fourteenth century, of a noble and wealthy family. He was educated at Saragossa under the care of his uncle, Don Zimeno, Archbishop of that church, and studied law at Toulouse. King Alphonso XI. made him one of his privy council and Archdeacon of Alcántara. At the earnest request of the king, the chapter of Toledo elected him archbishop of that city. In 1340 he accompanied the king in his expedition against the Moors to Tarifa, and saved his life in that engagement. Three years after he was at the siege of Algesiras, was dubbed a knight by the king himself, and sent with an important mission to France. Alphonso was succeeded by his son, Peter the Cruel, with whom Albornoz could not enjoy the same degree of favour. This worthy prelate strongly remonstrated with him about his amours with Maria de Padilla, but the king, far from listening to his admonitions, endeavoured to sacrifice him to the vengeance of his favourite. Albornoz sought refuge in Avignon, where Clement VI., who at the time occupied the papal see, received him with the greatest demonstrations of esteem and respect, and created him a cardinal. Upon this he renounced the archbishopric of Toledo, saying, 'I should be as blameable in keeping a wife with whom I can no longer live, as King Peter is for abandoning his lawful wife in order to live with a mistress.' In 1353 he was appointed legate, and entrusted with the important mission of the reconquest of the papal states. With a handful of men, and the pledging of his own plate and jewels, he set out from Avignon. Upon entering Italy, he treated the inhabitants with so prudent a policy, that he gained them over to his side. He obtained a passage through Tuscany, and interested in his favour the republic of Florence. He then entered the papal states, and by the exertions of Colas Rienzo, whom he brought from Avignon, and by publishing indulgences for the faithful and excommunications against the rebels, caused the Romans to flock to his camp. He entered Montefalco and Montefiascone in triumph, gained over Gentile Magliano, the tyrant of Ferno, and reduced to obedience the Malatesti. In 1357 an intrigue raised against him at Avignon made the pope recall him; but the truth being discovered, the order was countermanded, and Albornoz, proceeding in his conquest, defeated Francesco Ordelafi of Forli, the most powerful of all the petty tyrants of Romagna, and after a long war placed the popes in possession of their state, not acquired by the old titles of worm-eaten parchments, but by the right of conquest. When Urban V. came to Italy, Albornoz went to meet him at Viterbo, and the pope called his legate to give him an account of his administration. The cardinal ordered a cart loaded with old keys and locks to be brought into the court of the house, and showing it to the pontiff, said, 'I have spent all my funds in placing your Holiness in possession of all the towns and castles, the keys of which I present to you.' The pope, sensible of his ungrateful mistrust towards a man who had done so much for him, embraced him cordially, and always after entertained for him the greatest esteem. Having been appointed legate of Bologna, he gave to that city a new constitution, and at his own expense founded there a college for the Spaniards. This college is composed of a rector, thirty students, and four chaplains, all Spaniards; one Portuguese only may be admitted. They are all subject to the rector, in civil as well as in criminal matters, and all enjoy the same privileges as the nobility. Cardinal Albornoz died at Viterbo, in 1364. The pope felt his loss so deeply, that for the space of three days he would not see any body. The remains of the cardinal were conveyed to Toledo, where he desired to be buried. The pope granted a plenary indulgence, as in the day of jubilee, to every person who should assist in carrying the litter in which the body was conveyed; and the people accordingly flocked in great numbers from towns and villages to meet the funeral procession of the illustrious deceased, and the body was literally carried upon men's shoulders from Viterbo to Toledo. Albornoz left behind him a work, which is extremely rare, *On the Constitution of the Roman Church*, printed at Jesi, in 1473. Sepulveda, a collegian of Bologna, published a short account of the life of Albornoz, in Latin, at Bologna, 1623, without mentioning dates. Mariana, in speaking of this celebrated personage, expresses himself in the following terms: 'at all periods of his life he was equally inflexible in matters of justice, a despiser of riches, constant, without weakness in moments of difficulty, and it is hard to say, whether he was more noted for his prudent government in time of peace, or for his skill and valour in war.' [See Mariana; Garibay.]

ALBOURS or **ALBURZ.** [See Elburz.]

ALBUERA, or **ALBUHERA**, a village on a small river of the same name which falls into the Guadiana above Badajoz. The village is situated on the main road from Seville to that fortress, and is distant from the latter about sixteen miles. On the 16th of May, 1811, Albuera was the scene of a desperate conflict between a French army, under Marshal Soult, and an allied force of British, Portuguese, and Spanish, under Marshal Beresford. Soult was advancing from Seville to compel Beresford to raise the siege of Badajoz, and the latter prepared to receive him at Albuera. The allied army consisted of 30,000 infantry (but of these little more than 6000 were British), somewhat above 2000 cavalry, and 38 guns. Soult commanded 19,000 chosen infantry, with 4000 cavalry, and 50 guns. The position of the allies was on a ridge parallel to the river, with the British in the centre above the village, and the Spaniards on the right wing. The French, on the other side of the river, were concealed by the woods. Soult commenced by an attempt to force a bridge leading to the village; but this was only to draw away the attention of the British from the real point of attack. Fifteen thousand men and forty guns crossed the river opposite to, or rather above, the extreme right of the Spaniards, and gained a position, which not merely promised an easy victory, but threatened the retreat of the allies. Thus Beresford found it necessary completely to change his front when the battle was already commenced, for nearly the whole of the French force was directed upon the right flank, and not a British soldier was there. The Spaniards could not be induced to advance against them; and the first division of the British that was brought before the French troops suffered so severely, that Beresford was already meditating a fatal retreat, when Colonel Hardinge took upon himself to order the advance of the remaining British infantry. This order was nobly obeyed; and at the very moment when the victory seemed to be in the hands of the French, the British infantry advanced, and not giving the French time to open their heavy masses—for they had imprudently charged in column—drove them, with tremendous slaughter, from their position. This movement decided the day. The French, protected by their superior cavalry, re-crossed the river, and the allies remained masters of the field. The loss of the French in killed and wounded was 8000; that of the allies, 7000, besides 500 unwounded prisoners who remained in the hands of the French. The whole brunt of the battle had fallen upon the British, of whom not more than 1500 out of 6000 were left standing. Had Soult repeated the attack on the following day, nothing could have saved the allies, as Beresford himself confessed; but the French general was deceived by the bold front which Beresford presented, and commenced a retreat on the 18th, leaving part of his wounded to the generosity of the British The victory of Albuera added little to the reputation of Beresford; but never was better evidence given of the stubborn courage of British infantry. (Napier's *War in the Peninsula*, vol. iii.)

AL-BUFERA, the name of several lagunes on the southern coast of Spain and Portugal. It is derived from the Arabic article *al* and *boheira*, the diminutive of *bahr*, water or lake. Among these, the most remarkable is Albufera de Valencia, which, commencing five or six miles to the south of that city, covers a surface twelve miles in length, from north to south, and four in breadth. A narrow strip of land separates it from the sea, with which there is a communication by a small opening. It abounds in wild-fowl and fish, and is a source of considerable revenue. This revenue, in 1808, was attached to the crown; and was afterwards given to the Duke of Wellington as a reward for his services during the war with France. It is almost superfluous to say that the neighbourhood of these lagunes is generally the seat of intermitting fevers. (Miñano.)

ALBUM, a Latin word signifying any thing white. The prætor's album was probably a board, either having the surface or the letters white, on which the acts and edicts of that functionary were inscribed and publicly exhibited. The opinion of some writers who have supposed that it was the room or place where such notices were hung up is undoubtedly erroneous. Among the later Latin authors we read of the album of the judges, the album of the senators, and even the album of the citizens, which seem to have been books or registers in which the names of persons of those orders were enrolled. In the middle ages we find album, and albus, and albo, (as an indeclinable noun,) used for a register of saints, a muster-roll of soldiers, or, in general, any list or catalogue of names. Album, also, sometimes signifies a letter or epistle, in allusion to the white surface of the paper or parchment. (See the *Glossaries* of Ducange and Carpentier.) An album, in modern times, is a book appropriated usually to receive the signatures or other manuscript contributions of authors, travellers, or any other persons of whom it is thought worth while to collect such memorials; but sometimes, also, merely as a repository of drawings, prints, verses, and other miscellaneous fragments. On the continent the note-book of a tourist, in which he makes on the spot his memoranda of places and occurrences, is often called his album; but such a use of the word is not, we believe, known in this country.

ALBU'MEN, from the Latin word *Albumen*, the white of an egg. The peculiar substance designated by this term, forms a constituent principle of organised bodies. It is common to plants and animals; and its essential properties are found to be the same from whichever kingdom of the organised world it is derived.

Vegetable albumen is found in the green feculæ of plants in general; in the fresh shoots of trees, in the sap of many plants, in the bitter-almond, the sweet-almond, and the emulsive seeds in general; but it exists in the greatest abundance in such vegetables as ferment without yeast, and afford a vinous liquor.

Vegetable albumen is coagulable by heat; before coagulation it is soluble in cold water; after coagulation it is insoluble in water; it is insoluble in alcohol; sparingly soluble in acids; abundantly soluble in alkalies, and from the alkaline solutions it is precipitated by acids. Vegetable albumen is one of the few vegetable substances, into the composition of which nitrogen enters as a component principle.

Albumen exists much more abundantly in animals than in plants. It forms a constituent both of the animal fluids and solids. Of the animal fluids, it forms an essential part of the serum of the blood; it abounds in the fluid that moistens the surface of the internal cavities of the body and of the organs they contain, and it exists in large quantity in the watery fluid poured out into those cavities in the disease termed dropsy. In the animal solids it forms the principal part of all membranes; of the skin, of fibrin, the basis of muscle or flesh, and of the organs called glands.

Animal albumen then exists in the animal body in two states, in the fluid and the solid form. The best example of fluid albumen is the white of egg. The white of egg consists entirely of albumen held in solution in water, and combined with a small quantity of saline matter. It is, therefore, nearly pure albumen. In this state it is a thick glairy fluid, denser than water, insipid, without odour, mixing readily with cold water, in a large quantity of which it is completely dissolved. Exposed in this fluid form to atmospheric air, it runs rapidly into putrefaction; but if a thin layer of it be exposed to a current of air it dries and is converted into a solid, hard, and transparent substance resembling horn, and in this condition it may be preserved for any length of time without change.

The most remarkable character of albumen is the property it possesses of changing from a fluid to a solid state on the application of heat. This process is termed coagulation. If the white of an egg be exposed to a heat of about 134° of Fahrenheit, white fibres begin to appear in it; if the heat be raised to 160°, the fluid substance is converted into a solid mass; if the heat be still further increased to 212°, it dries, shrinks, and assumes the appearance of horn. In proportion as albumen is diluted with water, it requires a higher temperature to coagulate it; but if water hold in solution only the one-thousandth part of its weight of albumen, the water is rendered opaque by boiling. Before coagulation albumen is abundantly soluble in cold water; after coagulation it is no longer soluble in water.

But heat is by no means the only agent capable of coagulating albumen. Fluid albumen is changed into a solid by alcohol, and one of the readiest modes of obtaining solid albumen is to agitate white of egg with ten or twelve times its weight of alcohol. The alcohol unites with the water which held the albumen in solution, and the albumen is precipitated under the form of white filaments.

Albumen is also coagulated by all the stronger acids, the sulphuric, the muriatic, and the nitric; but not by the acetic. It is also coagulated by the metallic salts, such as muriate of tin, subacetate of lead, muriate of gold, &c.; and so delicate a test of the presence of this substance is the bichloride of mercury, or, as it is commonly called, corrosive sublimate, that if a single drop of a saturated solution of corrosive sublimate be let fall into water containing only the two-thousandth part of albumen, it will occasion a milkiness in the water, and produce a curdy precipitate. If a slight excess of the mercurial solution be added to the albuminous liquid and heat applied, the precipitate which falls on being dried is found to contain in every seven parts, five of albumen.

Galvanism also coagulates albumen. If an albuminous fluid be exposed to the agency of galvanism, pure soda will make its appearance at the negative wire; while the albumen will coagulate around that which is in connexion with the positive pole of the battery. (See Lessaigne, *Annales de Chimie.*)

The process of the coagulation of albumen by heat is not clearly understood. When this substance is coagulated by a chemical agent, such as a metallic salt, it is conceived that the albumen is thrown down in consequence of forming an insoluble compound with the substance employed. This is also supposed to be the mode by which acids coagulate it; but when heat is the agent by which the coagulation is effected, the operation is conceived to consist mainly in the abstraction of the alkali contained in the albumen. According to this account, liquid albumen is supposed to be a solution of solid albumen in alkali; heat abstracts the alkali, and, consequently, the albumen can no longer retain the fluid form. But to this explanation Dr. Bostock objects that it is proved by direct experiment, that the quantity of alkali in albumen is too minute to retain it in solution, and that the alkali may be neutralized and the albumen still retain its fluid form.

Albumen, like most other animal substances, is composed of carbon, hydrogen, oxygen, and nitrogen. According to the analysis of Gay-Lussac and Thénard, the proportions are,

Carbon . .	52·883
Hydrogen . .	7·540
Oxygen . .	23·872
Nitrogen . .	15·705
	100

According to Dr. Prout, the proportions are the following

Carbon . .	50
Hydrogen . .	7·78
Oxygen . .	26·67
Nitrogen . .	15·55
	100

Animal albumen, as well as vegetable, furnishes ammonia when decomposed by heat. This fact shows their probable similarity, although vegetable albumen has not been analyzed.

Albumen, from its property of coagulating by heat, is of great use in the clarification of liquids. The albumen, as it is rendered solid by the application of heat, entangles all the substances not held in solution by the fluid, and carries them with it to the surface in the form of scum.

But the most interesting application of albumen is its employment as an antidote against one of the most virulent of the mineral poisons. Corrosive sublimate, or bichloride of mercury, is scarcely second in the violence and certainty of its poisonous properties to arsenic itself. For this poison, albumen is a sure and effectual antidote. The world is indebted to Orfila, the celebrated Parisian toxicologist, for this discovery This distinguished man has instituted many experiments by which he has established the fact, of which the following may serve as an example. He gave twelve grains of corrosive sublimate to a small-sized dog; the poison was allowed to act for four minutes. by this time there were unequivocal indications of the commencement of its ordinary effects The antidote was then administered, the white of eggs being freely given. After several fits of vomiting, the animal became apparently free from pain, and in five days was quite well. Another experimentalist gave a dose of the poison to a rabbit; he allowed it to act uncontrolled; the rabbit was dead in seven minutes. He then gave a similar dose to another rabbit; he administered albumen in the form of white of eggs just as the first indications of uneasiness commenced, and in this case no serious symptom of any kind ensued. It would seem as the result of several experiments, that the white of one egg is required to render four grains of corrosive sublimate innoxious. The efficacy of this antidote has been fully established in the human subject. Several cases are on record in which this poison was taken both by accident and design, in which the immediate and free administration of the white of eggs disarmed it of all noxious influence. A man took half a drachm of corrosive sublimate, and was attacked with the usual symptoms. The white of eggs was immediately and freely administered The symptoms were at once arrested, and the patient recovered without sustaining any material inconvenience. This remedy once saved the life of Thénard, the celebrated chemist. While at lecture this gentleman one day inadvertently swallowed, instead of water, a mouthful of a concentrated solution of corrosive sublimate. He instantly perceived the fatal error he had committed; but he was aware of the remedy. He sent immediately for eggs, which he was so fortunate as to procure within the space of four minutes. He swallowed the white of eggs freely. At the time when he began to take the remedy he had not vomited; neither did vomiting occur at all; consequently the whole of the poison must have been retained, and yet he sustained no material injury. There cannot be a doubt that without the prompt use of the albumen he would inevitably have died.

ALBU'MEN, in plants, is the substance which in some seeds is interposed between the embryo and their coat. It varies very much in density, and other characters, and is often the most valuable part of a plant. In the cocoa-nut, it is the meat, the milk being a fluid, uncondensed portion of it; in the coffee-seed, it is the part that is roasted; and in corn, it is that which is ground into flour. The oil of the castor-oil plant, and of the poppy, the aroma of the nutmeg, and the greasy, nutritious substance that forms chocolate, are all the produce of albumen.

This substance in the beginning is of a pulpy nature, and is the matter in which the young embryo first makes its appearance; in this state it is present in all plants, but as the embryo, for the nutriment of which it is destined, increases in size, the albumen is gradually absorbed by it, either wholly, as in the turnip, the pea, the bean, and the like; or in part only, the residue being of a consistence varying between softness, as in the poppy, and extreme hardness, as in the date palm.

Botanists find its presence in abundance, or its total or almost total absence, a character of very great importance in distinguishing the different tribes of plants.

ALBUQUERQUE, ALFONSO, (or, as the Portuguese write his name, Affonso Alboquerque,) the greatest of those captains who built the short-lived fabric of Portuguese empire in India, was born at Melinda, in Africa, A. D. 1452. He was the second son of Gonzalvo d'Albuquerque, lord of Villaverde, descended of a bastard branch of the royal family of Portugal. In his youth he was first esquire to king John II.; but he first becomes well-known to us in the year 1503, when, in conjunction with Francisco Albuquerque, his cousin, or uncle, he conducted a fleet to India, and secured the king of Cochin on his throne, which had been endangered by his powerful neighbour, the *Zamorin* of Calicut. These two cities were situated on the coast of Malabar, both to the south of Bombay, in lat. 9° 57′ 30″, and 11° 15′ respectively; E. lon. 76° 16′ 15″, and 75° 50′. In gratitude for their services they obtained leave to build a fort at Cochin, which, according to the Portuguese authors, is to be considered as the foundation of their national empire in the East. Francisco Albuquerque was wrecked on his voyage home. Alfonso reached Lisbon safely, July 16, 1504, and was favourably received by the king, who sent him out to India again, in 1506, in command of a squadron of five ships, composing part of a fleet of sixteen, under the orders of Tristan da Cunha. For a time the generals carried on a prosperous warfare against the Moorish cities on the eastern coast of Africa. Da Cunha, sailing for India, left Albuquerque to command in the Arabian seas; who, weary of the petty piratical warfare in which he had hitherto been engaged, conceived the project of taking the small but important island of Ormuz, in lat. 27° 8′, at the mouth of the Persian Gulf, which, being admirably situated for commerce, was at that time one of the great emporiums of the East. Accordingly he appeared before Ormuz, Sept. 25, 1507, having already in his course reduced most of the chief trading towns between the Red Sea and the Persian Gulf. The terms of his message to the prince whose territory he invaded are worthy of attention. He came, he said, not to bring war, but peace,—peace, however, to be obtained only by paying tribute to the king of Portugal, instead of the king of Persia; but then the Portuguese monarch was so great a lord, that it was better to be his vassal than to command empires. Zeifadin, king of Ormuz, was a youth, and the government was really in the hands of a eunuch, named Cogi-Atar, who underrated the advantage of being subject to the Portuguese, and plainly said that their demands were impudent and unreasonable. But their cannon proved cogent arguments; and he was obliged to submit, after the shipping and part of the town had been burnt. Cogi-Atar was deeply mortified when he saw to what a handful of men he had yielded. He concerted a revolt, which proved successful. Albuquerque was compelled to evacuate the place; and after an unsuccessful attempt to reduce it by famine, returned to the island of Socotra, off Cape Guardafui, leaving his chief purpose unaccomplished.

Being joined by three ships bound to India, he set sail for the Malabar coast, in 1508. He carried out a secret commission, authorizing him to supersede Don Francisco d'Almeida, governor of the Indies, when the period of his commission should have expired. On arriving at Cananor he informed Almeida of this; but the governor, already prejudiced against him by the reports of some officers, who had treacherously sailed away from his squadron, and thereby caused his failure at Ormuz, received him very coldly, declined either to surrender the government or to accept his services in any subordinate capacity, and finally threw him into prison, where he remained three months. The arrival of the Grand Marshal of Portugal, with a powerful fleet, restored him to liberty. Almeida returned home; and Albuquerque was acknowledged General and Commander-in-Chief in India.

This fleet was intended to act against the Zamorin of Calicut, whose long-continued hostility had made him very obnoxious to the Portuguese. The Marshal entreated Albuquerque to entrust him with the command in this service, and Albuquerque reluctantly consented; but only by halves. The fleet accordingly was divided into two squadrons. A veteran officer augured ill from this arrangement, and said that there was little good to be expected from one body with two heads. His prediction was verified: jealousy of Albuquerque, whose division had gained the start in landing, and foolhardy courage, induced the Marshal to venture too far with a small number of followers, in hopes of gaining possession of the Zamorin's palace. He succeeded in this; but the Indians rallied, and he was surrounded and slain, with most of his principal officers. Albuquerque, in attempting to rescue him, was desperately wounded; and the Portuguese were forced to return to their vessels with considerable loss, having done much injury to the town and shipping.

The commission of Albuquerque was far less extensive than that of his predecessors in the Indian government, which had extended from the Cape of Good Hope to the farthest regions of India. The court of Portugal now divided this mighty charge into three portions—one comprehending the eastern coast of Africa and the coast of Asia, from the tropic of Capricorn to Cambay , the second, Hindoostan, which was allotted to Albuquerque; the third, the rest of India east of the Ganges. Its chief object was to prosecute its conquests in the Red Sea, and to monopolize the Indian trade by destroying that carried on between India and Egypt. With this view the greater part of the reinforcements sent to the East were ordered to act in the Red Sea, under the command of George d'Aguiar; and Albuquerque thus seemed placed in a secondary command: but by good fortune and good policy he succeeded in frustrating, in some degree, the designs of the court, and contrived to gain nearly as extensive authority as his predecessors had held. Diego Lopez de Silveira, who was sent out to the eastern division with an independent command, failed in establishing a settlement at Malacca, lost some of his ships, and returned to Europe, leaving two of them with Albuquerque. D'Aguiar perished in a storm, and of his scattered ships some went to India, which Lemos, the successor of D'Aguiar, sent to demand. For some time he got nothing but fair words: at last the general, assembling a council of his officers, told them, that by the orders of his court he was to send all the succours which he could to Lemos, and that he was determined to go in person. The whole force under his command set sail from Cochin, ostensibly for the Red Sea; but before they arrived off Goa, they were met by Timoia, prince of Onor, who urged the impolicy of going to the Red Sea to attack the Caliph of Egypt. He added, that, in the absence of the prince of Goa on other wars, the present was a most favourable moment for the enterprise. The statement of Timoia was laid before a military council, and the governor gravely remarked on the inexpediency of disobeying express orders, unless on very sure grounds of advantage. It is not certain whether this scene was previously arranged with the Indian prince, or whether

Albuquerque had been sincere in his proposed intention of sailing for the Red Sea. His ambition, and jealous care of his own glory, would lead us to believe the former; and the change seems too important to be so hastily made, had it not been contemplated beforehand. In fine, it was resolved to sail to Goa; and that rich and prosperous city fell into his hands almost without resistance. His energy may be judged from the rapidity with which his enterprises were conducted. He appeared before Calicut January 2, 1510, and though severely wounded there, he entered Goa the 17th February following. But he was unable to hold it. That town, in name belonging to the Deccan, was governed by a Moor named Idalcan, who, like other powerful Indian subjects, paid little obedience to his nominal sovereign. He was absent when Albuquerque took his town, but he lost no time in collecting a powerful force, and by dint of numbers regained possession of it, and shut the Portuguese up in the citadel. Albuquerque's difficulties were increased, and in great measure produced, by the discontent, mutinous conduct, and almost treachery, of his officers. At last he was reduced to the alternative of abandoning the citadel and taking to his ships, or suffering the river to be blocked up, and all chance of escape lost. He chose the former. But the bar being impassable during the south-west monsoon, which had already set in, he was obliged to remain in the harbour, compelled by the enemy's fire constantly to shift his place, and exposed to all the evils of famine. His energy and the bravery of his troops triumphed over their embarrassments; and they maintained their ground, though not without much loss and suffering, till the navigation was again open. Finally he left the harbour August 15, 1510. The history of this siege of Goa is full of interest, and will repay the trouble of perusing it at length.

In the course of the year strong reinforcements were sent out from Portugal, and, at the same time, Lemos was recalled, and his command made over to Albuquerque. The same autumn Albuquerque attacked Goa a second time, and carried it by storm, Nov. 25. Early in the next year he meditated new conquests. A detachment of the fleet which had been sent out in the preceding year, was especially ordered to proceed to Malacca under the command of Diego de Vasconcellos. Albuquerque, as he had done before in the case of Lemos, detained this squadron for his own use; by fair means while he could; but when Vasconcellos expressed at length his resolution to proceed forthwith to his appointed destination, he hesitated not expressly to forbid his doing so, under pain of imprisonment to himself, and death to all inferior officers under his command. Vasconcellos, undeterred by these threats, set sail, but he was stopped by a superior force, and was himself sent back to Portugal, while three of his officers were put to death. It is possible that the letter of Albuquerque's commission might justify him in exacting obedience to his own orders from all persons in his government, even to the disobedience of orders received from the king. Still the act was cruel and selfish, and highly illustrative of his character. Looking to the circumstances, there can be no doubt but that the motive for it was not the maintenance of discipline, but a resolution to monopolize every opportunity of acquiring fame and power in India. As soon as Vasconcellos was removed, Albuquerque sailed himself on the expedition against Malacca, (lat. 2° 12′, long. 102° 5′ 15″,) which hitherto he had put off on different pretexts, and, with some difficulty, captured the town, which was given up to plunder. Immense wealth was obtained. The fifth of the booty, which was set apart for the king, was valued at 200,000 gold cruzadoes, exclusive of naval and military stores, among which 3000 cannon were said to have been found. In this expedition his troops amounted only to 800 Portuguese, and 200 Malabar auxiliaries: the Malayan prince is said to have had 30,000 men under arms.

Albuquerque had it much at heart to establish the Portuguese power as firmly at Malacca as at Goa. He built a citadel, coined money, established a new system of law and police, and lost no opportunity of conciliating the natives. He received and sent embassies to the kings of Siam, Pegu, and other neighbouring princes, who were deeply impressed by the rapid growth of the power of these European strangers. After remaining at Malacca near a year, he set sail for Goa. On his voyage he encountered a violent storm; his ship was wrecked, and he himself, washed into the sea, narrowly escaped with his life. He reached Cochin with the scattered remains of his squadron at the end of February, 1512. His first object was to proceed to the relief of Goa, which in his absence was hard pressed by Idalcan. But the Portuguese force in India was never large; and owing to the casualties of war and shipwreck, and the loss of the troops left in garrison at Malacca, he was obliged to wait for the arrival of the annual reinforcements before he could bring his favourite city effectual help. Moreover he found much to be remedied, and much that required his presence at Cochin, where the extortion of the principal Portuguese, and the scandalous lives of all, had very much alienated the good will of that friendly city. Having obviated these evils as well as he could, he sailed for Goa, September 13, 1512. He was received with lively joy; his presence soon removed all cause for disquietude, and established the power of the Portuguese more firmly than ever. He relaxed the king's dues, and gave every encouragement to commerce, and Goa soon became the most flourishing city of the Portuguese dominions. It was observed, even then, that the king's revenue was increased, instead of suffering, by the reduction of duties. Idalcan and the Zamorin of Calicut, thinking further resistance hopeless, sued for peace, and the Portuguese influence was effectually and surely established along the Malabar coast from Cape Comorin to Goa.

The orders of the court were still urgent to prosecute the war in the Red Sea; and seeing India quiet, he now, in 1513, directed his efforts to the reduction of Aden [See ADEN], a considerable commercial town of Arabia. His force, much larger than usual, consisted of twenty ships, 1000 Portuguese, and 400 Malabar troops; (Barros, *Decad. II.* lib. vii. cap. 9.) but he reaped neither honour nor profit by this voyage. Repulsed at Aden, he entered the Red Sea, leading the first European *fleet* that ever sailed in its waters; but he experienced much hardship and danger from heat, want, and difficulty of navigation, and returned to India without striking a blow.

His last enterprise was a second attempt upon Ormuz, in which he succeeded (1507) without recourse to arms, by the effects of terror and negotiation; and the place remained in the hands of the Portuguese till it was taken from them in 1622, by the English and Shah Abbas. [See ABBAS.]

Albuquerque, after his first failure, vowed never to cut his beard till he had regained Ormuz, and it is said that he wore it till he could knot it to his girdle. Soon after the accomplishment of this favourite wish he fell sick, and was obliged to return to Goa. At the mouth of the Gulph he met a vessel bearing despatches from Europe. They signified his recall; that Lopez Soarez d'Albergaria was nominated his successor; and that Diego Pereira and Diego Mendez de Vasconcellos were appointed to high offices. His proud spirit was deeply hurt. 'What!' he said, 'Soarez governor! Vasconcellos and Pereira, whom I sent home as criminals, sent out again in posts of honour! I have gained the hate of men for the love of the king, and am disgraced by the king for the love of men. To the grave, miserable old man! to the grave, it is time!' He might have seen something more in this,—a just return for his unworthy treatment of Vasconcellos. His illness, aggravated by vexation, proved fatal. He died December 16, 1515, in his 63rd year. His body was conveyed to Goa, and buried in the church of Our Lady, which he had built; and in future years—a touching testimony to the uprightness of his government—Moors and Indians repaired to his tomb, as to that of a father, to implore redress from the injustice and tyranny of his successors. His bones, more than fifty years after his death, were transported to Portugal.

Albuquerque has undoubted claims to the name of a great man. To his country he rendered most important service: and if, in the irresponsibility of a distant command, he presumed sometimes to contravene or neglect the orders of his king, he was actuated by no more ignoble motive than the love of glory, and ever had in view the welfare of his country, and next to that, his own honour. As a public servant he was scrupulously honest; as governor of an obedient people, scrupulously just; though his temper was austere and arbitrary, and his punishments were awfully severe. His views as a statesman were enlarged and judicious, his skill great as a general, his courage as a soldier daring to rashness. On the other hand, where territory was to be gained to his country, or renown to himself, he was stopped by no considerations of right or wrong. The attack on Malacca admits of justification; but the capture of Ormuz and Goa were provoked by no acts of hostility, and can be sanctioned by no law but that of the longest sword. His character is well exemplified in a scheme which he is said to have proposed to the Emperor of Ethiopia for destroying the commerce of Egypt by turning the course of the Nile into the Red Sea, and thus converting that fruitful land into a barren desert. The project is called grand by historians . it is certainly great; but the very idea of such an impossible undertaking throws some discredit upon the General's knowledge. And it seems never to have occurred either to them or to him, that there would have been any moral guilt in blotting out from the earth a fertile, populous, and extensive country, to gratify the grasping thirst for monopoly of a second-rate European kingdom.

The second decade of Barros's *History of the Portuguese Conquests in the East* is entirely occupied by the transactions of which we have here given a short sketch, from the sailing of Da Cunha and Albuquerque to the death of Albuquerque. Those who do not read Portuguese may consult Maffei, *Historia Indica;* Lafitau, *Hist. des Conquêtes des Portugais dans le Nouveau Monde;* and the *Modern Universal History.*

ALBURNUM, in plants, is that part of the stem of trees which timber-merchants call *sapwood.* It is the newly formed, unchanged wood lying immediately below the bark, and is always of a very light colour. It is the principal channel through which the crude sap is conveyed from the roots into the leaves, and is, therefore, an indispensable part in all exogenous trees. [See AGE OF TREES.] It consists of little besides vegetable tissue; in which respect it differs from *heartwood* or *duramen*, which is vegetable tissue combined with solid secretions, the nature of which varies with species. It is probably on the latter account that heartwood is so much more durable than sapwood; for all vegetable tissue is in itself equally perishable, and it only ceases to be so in consequence of the presence of secretions of a less destructible character.

While many plants have the alburnum and heartwood distinctly separated, there are others, technically called whitewooded trees, which consist of nothing but alburnum. This arises from their not forming any solid secretions which can give durability to the central parts; hence all such trees are quickly perishable, and are generally unfit for any but temporary purposes.

ALBY, or **ALBI**, a town in France, the capital of the department of the Tarn, and upon the left or south bank of the river which gives name to the department. It is an archiepiscopal see, and perhaps the worst built of all places of similar rank in France. It is not, however, without objects worthy of notice. The cathedral is remarkable for boldness and elegance; the interior is adorned with old paintings; it has one of the best organs in France, and a fine choir; and it contains a silver shrine, in which were said to be preserved the relics of St. Clair, the first bishop of the see. The revenue of the archbishop is computed at about 20,000 francs (less than 850*l.*); his palace is on the banks of the Tarn, in a pleasant situation, and with an extensive prospect. The village of Châteauvieux, on the side towards Montauban (the west), forms a suburb of the town. Albi possesses a fine promenade planted with trees, called La Lice, just outside the city, formed by a terrace, and commanding a view of the adjacent country. The number of inhabitants is about 11,000; they have some manufactures of linen, cotton, hats, cord, and wax-lights. A library of 11,000 volumes, a museum of natural history, and a society of rural economy, trade, and statistics, contribute to the improvement of the place. There is also a theatre. Albi is 350 miles south of Paris: 43° 55′ N. lat., 2° 8′ E. long. from Greenwich.

The arrondissement of Albi contains 566 square miles, 105 communes, and above 75,000 inhabitants. The neighbourhood of the town, formerly the district of Albigeois, is fertile in corn, grapes, plums, and saffron; many sheep are fed; and a considerable trade is carried on in dried fruits, wine, and coarse cloth. This district is well wooded.

The name Albigeois, abovementioned, is derived from the Latin form of the name of the town, *Albiga,*—from which, likewise, it is said, the early reformers of this part took the name of Albigenses; whether from their prevalence in this neighbourhood, or because their opinions were condemned at the council of Albi, is uncertain. Some, however, derive the name Albigenses from Albigesium, the general denomination of Narbonese Gaul in the middle ages.

ALCA (*Cuvier*), the auk, a genus of web-footed sea-birds, which has a singularly-formed bill, being very broad when viewed laterally, straight towards the base, but much curved towards the point. Both the mandibles are half covered by projecting feathers, and furrowed near the point. The upper mandible is crooked, and the under forms a projecting angle. The nostrils are towards the middle of the sides of the upper mandible, being very narrow and almost closed by a membrane covered with feathers. The legs are short, and placed far back, so that the birds when standing have their backs nearly perpendicular. There are only three toes fully webbed, the back toe being wanting. The claws are somewhat pointed. The wings are short, and the first quill is as long as the second, or perhaps a little longer.

There are only two species known, the great auk and the razor-bill, both natives of the British Isles.

ALCÆUS, one of the most celebrated lyric poets of Greece. Of his compositions, once so much admired, nothing but fragments remain, consisting for the most part only of a few lines, or even words. These have been preserved in quotations by later authors. Among them we find two passages, which Horace evidently has imitated, in the two first stanzas of the eighth, and the two first stanzas of the fourteenth, odes of the first book. Horace makes frequent mention of him, and always in terms of the highest admiration. Alcæus was a native of Mitylene, in Lesbos; and wrote about the forty-fourth Olympiad, or B.C. 600· being the contemporary and countryman, and, it is said, the admirer also, of the celebrated poetess Sappho. Of his life but one anecdote worth relating is preserved, that, in a battle with the Athenians, he threw away his armour, (a mortal disgrace according to Greek notions of honour,) and sought safety in flight: a species of nervousness to which great poets seem to be addicted, to judge from the similar mishaps of Archilochus and Horace. The victors dedicated his armour in the temple of Athene, at Sigeum. From Alcæus, the Alcaic, one of the most beautiful of lyric metres, derives its name. His poems, we learn from Quintilian and Horace, were more severe and elevated in style and subject than those of most of the followers of the lyric muse: of the fragments preserved, however, many are in praise of wine. The most striking is one which has been finely expanded by Sir W. Jones. Alcæus aspired to be the poet of liberty; and directed the full vigour of his genius against Pittacus, who had raised his power above that of his fellow-citizens, or in Greek language, made himself *tyrant* of Mitylene. The best collection of the fragments of Alcæus is in the Cambridge *Museum Criticum,* vol. i. p. 421, and in Gaisford's *Minor Poets*, Leipzig, 1823.

Other persons of the name of Alcæus are named by ancient writers. We shall only mention two,—an Athenian tragic poet, and a comic poet who contended with Aristophanes for the prize, when he produced the *Plutus*, Ol. 98-1, B.C. 388.

ALCAIDE or **ALCAYDE**, a Spanish word derived from the Arabic *káyid* from the verb *káda*, which means to *head.* The *alcaide* was formerly the governor of a fortress or a castle, and also the keeper of a jail. This name is frequently mistaken by foreigners for that of *alcalde.* The offices of these two functionaries, however, differ very widely, as the one is a military officer, and the other a civil magistrate. (Covarrubias. *Diccionario de la Academia.*)

ALCALA′, a very common name in the southern parts of Spain, where the empire of the Arabs was of the longest duration. It is derived from the Arabic *El-Calaat*, which means a castle.

ALCALA′ DE HENARES, a town of Spain, in New Castile, situated in a fine plain on the river Nares or Henares, whence it derives its name. About a mile from its present situation, stood an ancient Roman colony, at the confluence of the small rivers Camorma, Camormilla, and Torote, and probably to this circumstance it owed its name of *Complutum, quasi Compluvium*, or a '*flowing together*.' This town was destroyed about the year 1000 of the Christian æra. The present city was rebuilt in 1083, and surrounded with a strong wall. It is also called Alcalá de San Justo, on account of the saint of this name having suffered martyrdom there under the the prætor Dacianus. The Moors possessed it until the beginning of the twelfth century, when it was conquered by Don Bernardo, Archbishop of Toledo. It is celebrated for its university, which was founded in 1510, and richly endowed by Cardinal Ximenez de Cisneros. The plan was taken from that of Paris, and embraced the study of divinity, law, astronomy, and languages. It was in this university, and at the expense of its founder, that the famous

Polyglot Bible was edited. The acquisition of seven Hebrew manuscripts alone cost 7000 gold crowns, and the most eminent philologists of the age contributed their talent to this undertaking. At the distance of about a mile from the city, stands a bridge upon the river Henares, from which the towers and domes of thirty-eight churches and nineteen colleges present a magnificent appearance. The Archbishop of Toledo has in this town a superb palace ornamented by the celebrated artists Berrugnete and Covarrubias. The cathedral is a fine gothic building in imitation of that of Toledo. In the college of St. Ildefonso is seen the sepulchre of Cardinal Ximenez, wrought in alabaster, with his reclining statue upon it, by Domenico Fiorentino. In the cathedral and the other churches are found excellent paintings by Arco, Sevilla, Carducio or Carducho, Ribera, and Gonzalez. The environs of Alcalá are pleasant and productive. Its climate is mild but rather cold in winter, owing to the want of trees, and the elevation of the city, which is about 2000 feet above the level of the sea. This city is the birth-place of the Emperor Ferdinand, the brother of Charles V., of Cervantes, of the poet Figueroa, of the historian Solis, of the famous divine Teodoro Beza, and several others.

The population is stated to be 5000. Alcalá is in 40° 29′ N. lat. and about 3° 25′ W. long. See Miñano, *Dicc. Geografico-Estadistico de España.* Ponz, *Viage de España.* Mariana.

ALCALA′ LA REAL, a town in the province of Jaen, on the Gualcoton. The district around is productive in wine and fruits; it has an elevation of more than 2700 feet above the level of the sea, and is the highest elevation between the Guadalquivir and Grenada. This territory separates the small streams that run southward to the Genil from those that run northward to the Guadalquivir. Alcalá has an abbey, two churches, a convent, and an hospital: its population is stated at 9000. It lies about eighteen miles W.S.W. from Jaen. General Sebastiani defeated the Spaniards under Areizaga near Alcala, (January 28, 1810,) in consequence of which Grenada opened its gates to the conqueror. (Napier's *Peninsular War*, iii. 115.)

ALCALDE, in Spain, is a judge appointed by the government, or elected by the towns to administer justice within the district under his jurisdiction. The word is a corruption of the Arabic *El-Cadi*, which means judge or governor, or, according to Alcalá, from *Cahid*, which comes from the root *calede*, to preside. There are several denominations of *alcaldes*. The *Alcalde de alzadas* is a judge appointed by the government or the lord of the district, to whom the parties may appeal from the decision of the *Alcaldes pedaneos* or justices of the peace. The *Alcaldes de casa y Corte*, is a bench of judges, who singly or jointly try all criminals within the court and twenty miles from it, or sixty, in cases of robbery. From the decisions of one of these *alcaldes* an appeal may be made to their tribunal. When the king travelled, one of these *alcaldes* was formerly obliged to assist the *mayordomo* in fixing the price of provisions on the road. In the *chancillerias* of *Valladolid* and *Granada* the criminal judges are called *Alcaldes de Crimen* to distinguish them from the civil ones called *Oidores*. The limit of their respective jurisdiction is the Tagus, *i. e.* those of *Valladolid* take cognizance of all criminal cases on their side of the Tagus, and those of Granada on the other.

The *Alcalde Mayor* is a judge appointed by the king or by the lord of the town to act as an assessor to the *Alcaldes* or *Corregidores*, who are not men of the law. The *Alcaldes Pedaneos* are elected by the people yearly; they preside at the common-council or *Ayuntamiento*, and act as magistrates. The parish-officers are also called *Alcaldes*, and are distinguished by appellations expressing their office, such as *Alcaldes de Barrio*, or parish, *de Calle*, of the street, *de Noche*, of the night, because they patrol and watch during the night. As there is no jury in Spain, all the judges both give the verdict and pronounce the sentence. It is, however, worthy of observation, that in the *fuero* of Toledo granted in 1083, it was ordered that all the cases should be tried by the book of the judges, in the presence of ten individuals of the most worthy and most wise of the city elected annually, who were always to sit at court with the judge. A sort of jury existed formerly in the Balearic islands, but so beneficent an institution no longer remains in any part of the peninsula. (*Diccionario de la Acad.* Garibay. Covarrubias.)

ALCAMO, a city of Sicily, situated in a district of the same name in the province of Mazzara. The city is built in a beautiful spot under Mount Bonifacio, about twenty-five miles S.W. from Palermo, and a league from the Gulf of Castello a Mare; it is considered healthy, and is said to contain 12,000 inhabitants. During the short period that Sicily possessed a constitutional government, Alcamo sent three representatives to the Sicilian House of Commons, two of whom were chosen for the district and one for the city. The first Italian who attempted to write poetry in the *lingua volgare* was a native of Alcamo; some fragments of his poem are to be found amongst the ancient Italian authors under the title of '*Ciullo d'Alcamo.*' Ciullo lived and died about the end of the twelfth century.

ALCA′NTARA (signifying in Arabic *the bridge*), a fortified town in Spanish Estremadura, on the southern bank of the Tagus, near the frontier of Portugal, 39° 44′ N. lat. about 6° 43′ long. It lies 55 Spanish leagues (about 230 miles) by the road W.S.W. from Madrid, but in a straight line not so much as 170 miles. The number of inhabitants is about 3300. Under the Romans, Alcantara bore the name of Norba Cæsarea, and was distinguished by a beautiful bridge of six arches over the Tagus, built in the reign of Trajan. When the Arabians became masters of this part of the peninsula, the Roman name was exchanged for Al-cantarat-al-seif, (see Edrisi, translated by Conde, p. 49,) *the Bridge of the Sword;* and hence the modern name. The position of the town upon the Tagus has always made it important in a military view, and in the year 1809, (June 10,) during the French war, the bridge was destroyed under an order of the British general. When this order was issued, the French were acting on the offensive, and a British detachment was stationed at Alcantara to break off the communication, should the French attempt a passage. Soon after, the state of affairs changed, the allied army began to advance, and the French in their turn wished to impede the movements of the former. Aware of the order under which the British officer was prepared to act, for by some error this order had not been countermanded, they made a false attack, which produced the effect they desired, and thus was the bridge of Trajan sacrificed, after having stood for seventeen centuries. Before the separation of Portugal, Alcantara enjoyed a considerable commerce on the Tagus, but this has altogether disappeared. (Miñano. Napier's *Peninsular War.*) Alcantara and Alcantarilla are the names of several unimportant towns in Spain and Portugal. There is also an Alcantara in Brazil.

ALCANTARA, THE KNIGHTS OF (la Caballería de Alcántara), a military and religious order of Spain, so called from the town upon the Tagus. About the year 1156, Ferdinand II. received from his father the kingdom of Leon with Galicia and Asturias. Of the first of these, a large portion was in possession of the Moors, especially the valley of the Coa (the river which passing near Almeida runs northward into the Douro). In this state of things, two brothers, with a body of knights from Salamanca, seized a hermitage in this valley called San Julian del Pereyro, which they converted into a fortress. Their efforts from thence against the Moors were equally distinguished by courage and success, and accordingly, in the spirit of the age, they were constituted by the Bishop of Salamanca a half religious, half military order of knights, under the rule of Saint Benedict; and the institution was confirmed by the Pope Alexander III., in 1177. When Alcantara was recovered from the Moors in 1213 by Alonzo IX. of Leon, the defence of it was at first assigned to the Grand-master of Calatrava. But it was not easy for the same person to guard two points so distant as Alcantara on the Tagus and Calatrava, near the sources of the Guadiana; and, therefore, under certain restrictions, the defence of the former was transferred to the knights of San Julian del Pereyro. This title was soon absorbed in that of Alcantara. Thirty-seven masters in succession commanded the noble order of Alcantara; and, like those of Calatrava and Santiago, they were at times almost too powerful for the monarchs of Spain. In 1494 or 1495 Ferdinand, the husband of Isabella, who had already assumed the command of the other two orders, prevailed upon Juan de Zuñiga, son of the Duke of Arévalo, to resign the grand-mastership of Alcantara. From that time the dignity has remained in the crown of Spain. A full account of the order has been given by Radez de Andrada in his *Chronicles of Alcantara*, and by Zapater in his *Cister Militante.*

ALCARRAZAS. [See Cooler.]

ALCARRIA, a district of Spain on the northern boundaries of New Castile. It is bounded on the east by Molina, on the south by the mountains of Cuenca and La Mancha, on the west by the territory of Alcalá de Henares, and by the mountains of Cogolludo, Jadraque and Sigüenza on the north and north-west. According to the signification of its name, which comes from the Arabic, and means a collection of farmhouses, its population consists of a multitude of small villages, the largest of which are Guadalajara, Huete, Brihuega, and Cogolludo. The territory is mountainous, but very productive, through the industry of its inhabitants. Its thick forests of oak supply Madrid with charcoal. It produces also wines, the best of which are those of Sacedon and Payos. The lofty hills enclose beautiful and fertile valleys, watered by innumerable rivulets, which spread fertility and abundance throughout the plains. The olive likewise enriches it with its fruit. Both the mountains and the valleys are covered with nutritious herbs, which supply with food the numerous flocks of Merino sheep, that in the summer months leave the scorched plains of Estremadura to seek the green and rich pasturages of the mountains of Castile. The shepherds of that part of Spain are persuaded that the fineness of the Merino wool would be lost if they were kept in the same place all the year round, and thus they make their cattle travel to the south in winter, and back to the north in summer, from which circumstance they are called *ganados transhumantes* or travelling cattle. The valleys of Alcarria as well as its mountains abound in flower-plants on which the bees feed, that produce the famed Alcarrian honey. The meat, game, and fish are of exquisite flavour. The inhabitants of Alcarria are, by far, richer and happier than their neighbours. It is true that very few large proprietors are found, but every one has some landed property, which he himself cultivates, and mendicity is here unknown. They are simple, industrious, and robust. The men are employed in cultivating the ground, and the women preside over the household concerns, and spin hemp and flax, with which they provide their families with clothing. Besides the brooks which spring from the mountains of Alcarria, the Nares or Henares, the Tagus, the Tajuña and Guadiana, cross and water its grounds. There are also in this district many springs and baths of mineral waters: the best known are those of Trillo and Sacedon. Its industry is confined to some manufactures of paper. (Miñano, *Diccionario Geográfico.*)

ALCEDO, a Spanish officer, best known to the world by the publication of a *Geographical and Historical Dictionary of America and the West Indies.* Of his private history we have met with no trace, except that it may be inferred from the dedication of his work that he was a South American by birth; and it is stated in the title-page that he was Captain in the Royal Spanish Guards. His work was originally published, in five small quarto volumes, at Madrid, 1786-9. It was immediately suppressed by the government, from jealousy at the mass of information concerning their Spanish settlements thus communicated to the public; and is now, in the original form, of extreme rarity. An English translation, however, has been published by G. A. Thompson, Esq., with additions and corrections, in five quarto volumes, 1812-15.

ALCE´DO (*Linnæus*), king-fisher, a genus of birds of which the characteristics are,—the bill long, straight, quadrangular, thick, and pointed; the tongue short, fleshy, flat, and slightly arrow-shaped at the point; the nostrils at the side of the base of the bill running obliquely, and nearly closed by a naked membrane; the legs with the shank (*tarsus*) short; the feet with three toes forward, the outer joined to the middle one as far as the second joint; the inner one similarly joined as far as the first joint. The hind toe is broad at the base. The wings have the first and second quills nearly equal, but these are shorter than the third, which is the longest in the wing.

There is only one species of king-fisher indigenous to Britain, but more than sixty species have been described by naturalists, chiefly natives of Asia and Africa, and all distinguished by the splendid colours of their plumage.

ALCES. [See Elk.]

ALCESTER, written also *Aulcester*, *Alencester*, *Alnacester*, *Alceter*, *Awseter*,—not to mention several other variations,—and commonly pronounced *Aulster* or *Auster*, and by some of the inhabitants, in Camden's time, *Ouldcester*, a parish and market town in the western part of the county of Warwick, situated at the confluence of the Arrow and the Alne, from which last it takes its name. It is 103 miles N.W. from London, and 16 miles W.S.W. from Warwick. Alcester is a place of great antiquity, and the name would indicate that it had been a Roman station; a supposition which is confirmed by the great numbers of Roman coins and other remains which have been found on the spot. It has been held by some to be the ancient Mandnessedum; but this is more probably Manceter on the Anker, in the north-east of the same county. Alcester has been generally supposed to be the Alanna of Richard of Cirencester. It stands on the old Roman way, formerly called Ykemild Street, and still popularly known as Ickle Street. An abbey was founded here in 1140 by Ralph Boteler of Oversley, on a piece of ground about half a mile to the north of the town, surrounded by the Arrow on the north and east, and by a moat on the other two sides. It was hence called the Church of our Lady of the Isle. Dugdale, in his *Antiquities of Warwickshire*, (published 1656,) says that, by that time, the ruins of this abbey had been dug up and the ground sown with corn. Britton, however, in his *Beauties of England and Wales*, (1814,) states that the moat was still traceable. The abbey, although at one time possessed of a considerable revenue, had, by means of alienations, become so poor about the middle of the fifteenth century, that it was found necessary, in 1465, to unite it to the neighbouring abbey of Evesham. The letters-patent issued by Edward IV. for this purpose, state that 'there then was not, nor of a long time had been, any monks to bear the abbot company.' The spot on which the abbey stood is still called the Priory Cross (or, according to Britton, the Priory Close). Leland, in his *Itinerary*, says, 'The town hath been a great thing. Some say there hath been three parish churches in it.' He remarks that, although it stands now chiefly on the Arrow, it must, as its name denotes, have anciently extended eastward to the Alne. It was formerly very famous for its wheat fair; but the principal branch of business which is now carried on in it, is the manufacture of needles, which, in 1814, employed about six hundred persons. Alcester is not noticed in Domesday Book, nor is there any written record of its existence before the reign of Henry I. It contains many old houses; a fine church, of considerable antiquity; and a handsome town-house, in which courts are held by the Marquess of Hertford, the lord of the manor. It has also two stone bridges, one over the Arrow, and the other over the Alne. A free-school was founded here in 1594 by Walter Newport, in a field south from the town. About a century ago, when Dr. Thomas published his edition of Dugdale, Alcester contained 176 houses paying, and 167 not paying, church and poor rates. In 1811, the inhabited houses were 401; and there were 10 uninhabited and 5 building. In 1821, there were 465 houses inhabited, 31 uninhabited, and 11 building. The population in 1801, 1811, 1821, and 1831, was, respectively, 1625, 1862, 2229, and 2405. The annual value of the real property in the parish in 1815 was 6354*l.* In 1821, there were 139 families employed in agriculture; 220 in trade, manufactures, or handicrafts; and 106 not comprised in either of these classes. Alcester lies in the hundred of Barlichway, and in that one of its four divisions called the Alcester division.

ALCHEMY, the pretended art of making gold and silver. The name appears to be derived from the Greek *χημεια*, chemistry, but the *al* prefixed to it denotes the probability of the Arabic origin of the imposture. Another, and subsequent object of alchemy was the preparation of a universal medicine. Those alchemists who were supposed to be skilled in the art were termed *adepts*, or *the adepts.*

In the opinion of the alchemists, all the metals are compounds, the baser of them containing the same constituents as gold, but mixed with various impurities, which, being removed, the common metals were made to assume the properties of gold. The change was effected by what was termed *lapis philosophorum*, or the philosophers' stone, which is commonly mentioned as a red powder possessing a peculiar smell.

It is not quite certain either at what period or in what country alchemy arose; and different opinions on the subject are expressed by authors. Dr. Thomson (*History of Chemistry*, vol. i. p. 14) supposes that it originated among the Arabians when they began to turn their attention to medicine, after the establishment of the Caliphs; or that, if it had been previously cultivated by the Greeks, as there is some reason to suppose, it was taken up by the Arabians and reduced by them into regular form and order. This conclusion is rendered extremely probable, on account of the prefix of the Arabic article *al.*

Hermes Trismegistus is generally mentioned as one of the earliest alchemists; but the writings bearing his name are undoubtedly spurious. In 1692, Dr. Salmon, in his *Clavis Alchymiæ*, published a translation of the *Tractatus Aureus* attributed to Hermes, with the works of some other alchemists. The translation is accompanied with notes which rival the original in absurdity. The word *hermetic*, still in common use, is derived from Hermes. Geber, an Arabian physician who lived in the seventh century, is one of the earliest alchemists whose works are extant; but some doubt of their genuineness is entertained. Dr. Thomson (*History*, vol. i. p. 15) remarks, that though the principles which lie at the bottom of alchemy were implicitly adopted by him, he does not attempt to make gold artificially, nor admit the possibility of converting the baser metals into gold. In Dr. Salmon's work, however, the following passage occurs, translated from Geber's *Alchemy of Sol*. 'Whatever metal is radically citrine, and brings to equality and cleanses, it makes gold of it; from whence we discern, that copper may be transmuted into gold by artifice,' &c. &c.

Geber also treats of the *Medicine, Tincture, Elixir, or Stone of the Philosophers in general*. Dr. Johnson supposes that the word *gibberish*, anciently written *geberish*, was originally applied to the language of Geber and his tribe; many of the quotations given by Salmon would certainly justify the etymology. Although it is also apparent that Geber was an alchemist in the most comprehensive sense of the word; and although his works abound with the most absurd and mystical phrases, yet his chemical labours were directed to the improvement of medicine. He has also described and depicted various furnaces, crucibles, alembics, aludels, and other useful chemical apparatus, of which he was probably the inventor; and he treats of distillation, sublimation, calcination, and various other chemical operations.

Omitting any mention of less celebrated alchemists, we proceed to notice Albert Groot, usually called Albertus Magnus, a German, who was born at Bollstaedt in 1282. He was acquainted with all the sciences usually taught in that age, and his works were published at Leyden in 1651, in twenty-one folio volumes, among which are seven tracts on alchemy. According to Dr. Thomson, Albertus, in his treatise *De Alchemia*, gives an account of all chemical substances known in his time; was well acquainted with chemical apparatus, and with the methods of purifying the precious metals. He imagined that the metals were composed of mercury and sulphur, and accounts for the diversity of them, by the difference in the proportion of their constituents and their purity. His writings are in general plain and intelligible. Thomas Aquinas is asserted to have been the pupil of Albert: he wrote three works on alchemy which are said to be always obscure, and often unintelligible; the word *amalgam*, signifying a compound of mercury and another metal, occurs, and probably for the first time, in his writings; which contain also some other terms, still used in chemistry.

The alchemist next to be mentioned is Raymond Lully, who was born at Majorca in 1235. He was a very singular person; he travelled to various kingdoms to preach Christianity, and died in 1315, on his passage from Africa, where he had been on this service.

Lully is stated to have been the scholar and the friend of Roger Bacon; his reputation as an alchemist was very high, and his works, which are generally obscure, amount to nineteen. He obtained nitric acid by distilling a mixture of nitre and green vitriol, observed its power of acting upon metals generally, and of dissolving gold when mixed with sal-ammoniac. He appears also to have known various other chemical compounds, and their action upon each other.

Roger Bacon, frequently called Friar Bacon, a Franciscan monk, was born at Ilchester, in Somersetshire, in 1314. Notwithstanding the great learning and scientific acquirements of Bacon, he was deeply imbued with the mystery of alchemy; this is the more remarkable, because he exposes the absurdity of believing in magic, necromancy, or charms. His chemical and alchemical writings amount to eighteen, a list of which may be seen in Dr. Thomson's *History of Chemistry*, vol. i. p. 35. Bacon appears to have been acquainted with the composition of gunpowder, and, by some, he is thought to be the inventor of it. It was, however, probably introduced into Spain by the Moors; and, Bacon, from his acquaintance with Arabic, might have acquired information of its composition from some writing in that language. Bacon has hinted at his knowledge of the ingredients of gunpowder, in his *Epistola de Secretis Operibus Artis et Naturæ et de Nullitate Magiæ*, in the following enigmatical sentence: 'Sed tamen salis petræ Luru. Vopo. Vir Can Vtriet sulphuris; et sic facias tonitrum et coruscationem, si scias artificium.' Saltpetre and sulphur being distinctly named, we have only to suppose charcoal to be concealed under the enigmatical terms quoted, and then all the substances contained in gunpowder are mentioned as capable of producing thunder and lightning when properly used.

It is not to be wondered at, in a barbarous age, that one who was skilled in so many sciences should be accused of witchcraft; we accordingly find, that Bacon was imprisoned on this charge, and narrowly escaped starvation, or being burnt as a magician. The real ground of his offence appears to have been his exposure of the immorality of the priesthood. He died either in 1284 or 1285; his *Opus Majus*, edited by Dr. Jebb in 1733, and the *Epistola*, already quoted, are the works of this author most worthy of perusal. In the list of Bacon's works already referred to, there are several professedly on alchemy. Dr. Salmon has translated one which is not among them, called *Radix Mundi*; another work on alchemy, called *Speculum Alchemiæ*, mentioned in the list above referred to, is also translated by Dr. Salmon.

Arnoldus de Villa Nova was not only an alchemist, but an astrologer and magician. He is said to have been born, in 1240, at Villeneuve, a village of Provence: he was educated at Barcelona, which place he was obliged to leave in consequence of foretelling the death of Peter of Aragon. When he left Barcelona, he went to Paris, and travelled through Italy; and afterwards taught in the university of Montpelier. He acquired high reputation as a physician; and was well skilled in several languages and in the sciences of his time.

He wrote about twenty different works, some of which are professedly on alchemy: the book entitled *Rosarium* is probably the most curious, it being intended as a compendium of the alchemy of the day. The second part of this work, which professes to treat of the art of making the philosophers' stone, is stated to be quite unintelligible. Like his predecessors, he considered mercury as a constituent of metals; and professed that he could increase the philosophers' stone at pleasure. He died in the year 1313, on his way to visit Pope Clement V., who lay sick at Avignon.

Raymond Lully and Arnoldus de Villa Nova are stated to have inspired men of all ranks with a taste for alchemy Pope John XXII. was one of them: he professed and described the art of transmuting metals; and boasts, in the beginning of his book, that he had made two hundred ingots of gold, each weighing a hundred pounds.

The fourteenth century produced a considerable number of alchemists,—as Nicholas Flammel, Pierre le Bon of Lombardy, the monk Ferrari in Italy, Cremer, abbot of Westminster, the disciple and friend of Lully, John Daustein and Richard, in England, practised and wrote upon hermetic philosophy. The work attributed to Flammel is generally reckoned spurious. The fifteenth century was more productive in adepts even than the preceding. About 1408 flourished John Isaac Hollandus, and his countryman of the same name, who were either brothers or a father and son. They were born in the village of Stolk, in Holland. Few circumstances are known respecting them. They wrote several treatises on chemistry, which are remarkable for clearness and precision, considering the time at which they appeared. In the opinion of Boerhaave, they were very distinguished chemists. Paracelsus and, subsequently, Boyle repeated many of the experiments contained in their works; they related, however, principally to the transmutation of metals. In this century was born George Ripley, who was canon of Bridlington, in Yorkshire: he published a work, called *Medulla Alchymiæ*, which is translated by Dr. Salmon, in his *Clavis*. This work is replete with the same sort of unintelligible jargon which usually abounds in such productions. He wrote another work, in rugged rhyme, called the *Compound of Alchemie*, which was dedicated to Edward the Fourth.

Basil Valentine, a Benedictine monk, of Erfurt, in Germany, was born at the latter end of the fourteenth century; and, with the exception of Paracelsus, he was, perhaps, the most famous professor of the hermetic philosophy: but he possessed, at the same time, very considerable merit as a chemical experimenter, and was much occupied in the preparation of chemical medicines. He first introduced antimony into medicine: his work on this subject is entitled *Triumph-wagen Antimonii*, which was translated from the German into Latin, under the title of *Currus Triumphalis Antimonii*, by Kerkringius, in 1671. In this book he strongly advocates the chemical sect; and treats the practice and theories of his opponents with great severity, because they are unable to prepare their own medicines: 'they know not whether they be hot or dry, black or white; they only know them as written in their books, and seek after nothing but money. Labour is tedious to them, and they commit all to chance; they have no consciences, and coals are outlandish wares with them; they write long scrolls of prescriptions, and the apothecary thumps their medicine in his mortar, and health out of the patient.'

Basil Valentine was of opinion that the metals are compounds of salt, sulphur, and mercury, and that the philosophers' stone was composed of the same ingredients. He was acquainted with many of the properties of several metals, and with the effects they were capable of producing by their chemical agency. He was, however, more particularly informed with respect to antimony, and knew most of the preparations of it which at present exist in the pharmacopœias of Europe. Twenty-three different publications have been ascribed to Basil Valentine, but it is uncertain how many of them were written by him. His works contain the first accurate mention of the nitric, muriatic, and sulphuric acids, with intelligible directions for preparing them; and he was acquainted with a very considerable number of metallic salts and compounds.

We have now mentioned the principal writers on alchemy. There arose, however, from time to time, various authors, who appear to have been rather believers in the possibility of the transmutation of metals than pretenders to have accomplished it. A list of alchemists, from Hermes, who is represented as having flourished nearly 2000 years before the Christian æra, down to Mathieu Dammy, in 1739, may be seen in the *Encyclopédie Méthodique:* it is copied from Dufrenoy's *Histoire de la Philosophie Hermétique*. This list contains names which are more familiar as chemists than as adepts; such, for example, as Paracelsus (who applied the philosophers' stone, not to the making of gold, but to the preparing of medicines), Libavius, Van Helmont, Glauber, and Kunckel.

To these believers in the art may be added Bergmann, a celebrated chemist of very late date, who, after summing up the evidence for and against the possibility and probability of transmutation, observes, respecting the numerous relations that have been given by writers of apparent veracity, that, 'although most of them are deceptive, and many uncertain, some bear such character and testimony, that, unless we reject all historical evidence, we must allow them entitled to confidence.'

The later Peter Woulfe, who was a Fellow of the Royal Society, and died in 1805, is reported to have been a believer in alchemy. His name is associated with chemical operations on account of the apparatus which bears his name, but which had been previously described by Glauber.

The last person, at least in this country, who professed to convert mercury into silver and gold, was Dr. Price of Guildford: he is said to have convinced some persons of the possibility of the transmutation; his experiments were to have been repeated before competent judges, but he prevented detection and exposure by destroying himself with laurel water. This happened in 1782.

For an account of that mysterious substance, the philosophers' stone, by which the wonders of transmutation were worked, and a detail of the process for preparing it, given in the words of an adept, we refer the reader to Dr. Thomson's *History of Alchemy*, p. 23.

Dr. Thomson states, that the philosophers' stone, prepared by the elaborate process above referred to, could hardly have been anything else than an *amalgam of gold;* and 'there is no doubt,' he adds, 'that amalgam of gold, if projected into melted lead or tin, and afterwards cupellated, would leave a portion of gold; all the gold, of course, that existed previously in the amalgam. It might, therefore, have been employed by impostors to persuade the ignorant that it was really the philosophers' stone; but the alchemists, who prepared the amalgam, could not be ignorant that it contained gold.'

In the *Memoirs of the Academy of Sciences* for 1772, M. Geoffroy published an account of the various modes in which the frauds of the adepts were carried on; some of these we shall mention. He observes that, instead of the mineral substances which they pretended to transmute, they put oxide (*chaux*) of gold or silver at the bottom of the crucible, the mixture being covered with some powdered crucible and gum-water, or wax, so that it might look like the bottom of the crucible. On other occasions, they made a hole in a piece of charcoal, filled it with powdered gold or silver, and closed the hole with wax; or they soaked charcoal in a solution of these metals, and threw the charcoal, when powdered, upon the material to be transmuted. They used, also, small pieces of wood, hollowed at the end, put filings of gold or silver into the cavity, and stopped it with fine sawdust of the same wood, which, on burning, left the metal in the crucible. Sometimes they whitened gold with mercury, and made it pass for silver or tin; and the gold, when melted, was exhibited as gold obtained by transmutation. They had a solution of nitrate of silver, or of muriate of gold, or an amalgam of gold and silver, which, being adroitly introduced into the crucible, furnished the necessary quantity of metal. A common exhibition was to dip nails into a liquid, and to take them out apparently half converted into gold: these nails consisted of one-half iron, neatly soldered to the other half, which was gold, and covered with something to conceal the colour, which the liquor removed. Sometimes they had metals made of gold and silver soldered together; the gold side was whitened with mercury, dipped into some transmuting liquid, and then heated; the mercury being dissipated, the gold portion of the metal appeared.

Bergmann, in his *Essays*, vol. iii. p. 93 (*History of Chemistry during the Middle Ages*), has given a number of cases in which gold had been supposed to be formed by the use of the philosopher's stone. They were unquestionably the results of some of the abovementioned tricks; but Bergmann states it as his opinion, that some accounts of transmutation are 'entitled to a greater degree of credit' than others. 'For, doubtless,' he adds, 'if a person, who has no faith in the changes of alchemistry, should obtain by chance a small piece of the philosophers' stone, and, on making the experiment alone in his closet, procure a quantity of gold heavier than the stone, will it not be difficult to explain in what manner he was liable to be deceived?' Before the difficulty is required to be explained, the fact must be placed on incontestable evidence.

The question has sometimes been asked, whether the labours of the adepts have been favourable or otherwise to the progress of chemical science? This question we should be inclined to answer in the negative, on account of the disrepute into which the jargon of their writings and the frauds of their experiments must have brought, not only their authors, but the [science which they abused. On this subject, Dr. Thomson, however, remarks (*History*, p. 30), 'As the alcaymists were assiduous workmen—as they mixed all the metals, salts, &c., with which they were acquainted, in various ways with each other, and subjected such mixtures to the action of heat in close vessels, their labours were occasionally repaid by the discovery of new substances, possessed of much greater activity than any with which they were previously acquainted. In this way they were led to the discovery of sulphuric, nitric, and muriatic acids. These, when known, were made to act upon the metals; solutions of the metals were obtained, and this gradually led to the knowledge of various metalline salts and preparations, which were introduced with considerable advantage into medicine. Thus the alchymists, by their absurd pursuits, gradually formed a collection of facts, which led ultimately to the establishment of scientific chemistry.' It may be also stated in favour of the alchemists, that phosphorus was discovered by an adept of the name of Brandt, at Hamburgh, in 1677 this he procured from urine, while searching for some substance capable of transmuting silver into gold.

Gibbon (*Decline and Fall*, vol. ii. p. 137), speaking of alchemy, says that, 'congenial to the avarice of the human heart, it was studied in China as in Europe, with equal eagerness, and with equal success. The darkness of the middle ages insured a favourable reception to every tale of wonder; and the revival of learning gave new vigour to hope, and suggested more specious arts of deception. Philosophy, with the aid of experience, has at length banished the study of alchymy; and the present age, however desirous of riches, is content to seek them by the humbler means of commerce and industry.'

ALCIBI'ADES, the son of Cleinias, was one of the most distinguished statesmen and generals of Athens, during the eventful period of the Peloponnesian war. Descended on both sides from the most illustrious families of his country, born to the inheritance of great wealth, endowed with extraordinary beauty of person, and with mental qualifications no less brilliant, it seemed evident from his early youth that he would exert no slight influence over the counsels and the fortunes of Athens. This marked him out to Socrates, as one on whom his moral influence might be exerted with beneficial results. The faults of Alcibiades were those of a spoilt child of fortune: he was fickle, selfish, overbearing, and extravagant. But these faults clouded, not concealed his nobler qualities. Passionately fond of show and splendour, a frequent victor in the Olympic games, and possessed of a more criminal notoriety as a favoured suitor among the most dignified matrons of Athens, he never lost sight of more manly objects of ambition; and he met the proffered friendship of Socrates with eagerness, as the surest means of acquiring that mental cultivation which at Athens was the best, though not the only key to political power. The philosopher soon acquired over his wayward pupil that influence which he seems to have exercised over all who came within his circle; and the close intimacy which arose between these opposite characters, was cemented by a singular reciprocity of benefits. In a battle fought near Potidæa, Socrates saved the life of Alcibiades, and the latter repaid the obligation by a similar service at the battle of Delium. But the influence of Socrates was insufficient in this case to work a permanent change of character; and the political life of Alcibiades proves that he had not profited much by the moral instructions of his master.

He became an orphan at an early age, and was placed under the wardship of his uncle Pericles. After the death of Pericles, Alcibiades being then but a child, Nicias and Cleon succeeded to a divided influence in the state: but with increasing years, Alcibiades was naturally regarded as one likely to take a leading part in politics, and he was not slow to assert the influence which seemed his due. At first he was inclined to cultivate the goodwill of Sparta; between which, and his own family, an ancient hereditary friendship had existed: but the Spartans, whose national character was utterly alien from that of the impetuous and volatile Athenian, chose rather to connect themselves with Nicias. Alcibiades readily changed his politics, when he found that, in that connexion, he could not be the leading man, and became as violent in enmity, as he might have been in friendship to Sparta, had his advances been more favourably received.

His first opportunity of thwarting the wishes of Sparta, and his first prominent appearance in public life, occurred in the year 421 B.C. A truce had been concluded between Sparta and Athens; but considerable difficulty arose in executing the terms of the treaty: much dissatisfaction arose in consequence at Athens; and it seemed a good opportunity to engage the people in a connexion with Argos, always jealous of Sparta, and then at the head of a strong confederacy of Peloponnesian states. Ambassadors arrived from both these cities at the same time: the Argians to solicit Athens to join their alliance; the Spartans with ample power to settle all disputed points: for it was of first-rate importance to them to prevent a junction between Athens and Argos. The prospect of accommodation with Sparta was far from suiting the views of Alcibiades; and he was not scrupulous as to the means by which it might be prevented. The ambassadors came with full powers to settle all points in dispute, and had made a statement to this effect before the council of five hundred. But before they were introduced to the general assembly of the citizens, Alcibiades persuaded them, that on account of the grasping temper of the Athenians, it would be better not to state the full authority with which they were vested. They followed his advice, to the great astonishment of Nicias, his party, and the whole council; and were in turn equally surprised when Alcibiades attacked them violently, reproached them with prevarication, and made an animated appeal to the people in favour of the Argian alliance. After some hesitation, his proposition was agreed to: and thus Athens was placed at the head of the principal confederacy of Peloponnesus, and Alcibiades became the leading political character, not only of Athens, but of Greece. His age at this time is not certainly known, but it was from five-and-twenty to thirty. Thucydides calls him 'still young.' In 419, he was made Strategos, or chief military officer of Athens, and during the next three years he took a prominent and active part in the complicated struggle of intrigue and war carried on in Peloponnesus during that period. It is said by Plutarch, but apparently on uncertain report, that he was principally concerned in the detestable massacre of the Melians.

About this time the Athenian people were chiefly influenced by three men, each of whom was the leader of a strong party; Alcibiades of the war, or anti-Laconian party, Nicias of those who wished for peace, and a sincere accommodation with Sparta. The third, Hyperbolus, a mob-orator of the meanest class, influenced a large proportion of the poorest citizens, who were numerically formidable in the general assembly. This man threw out no obscure hints of the expediency of banishing Alcibiades, as a person dangerous to the commonwealth from his wealth, power, and ambition; and in the divided state of parties he might, perhaps, have effected this, had not Alcibiades been assisted by Nicias, who dreaded and detested Hyperbolus as cordially upon political, as Alcibiades upon personal grounds. By their united efforts sentence of exile, under the form called ostracism, was passed on Hyperbolus. But the coalition lasted only till this was accomplished. Diametrically opposite in temper, as well as in politics, these rival statesmen could not bear divided power; and that Alcibiades might be supreme, it was necessary to excite some war in which his own versatile talents might find scope for their display, and by which the cupidity of the Athenians for both gain and glory might be gratified.

Such an opportunity was afforded by an embassy from Egesta, a small town in Sicily, which had become opposed to Syracuse, by far the most powerful city of that island. The Syracusans, a Dorian people, were attached to the Spartan interest, although hitherto they had interfered little in the affairs of Greece proper. But they had trenched materially on the independence of the Ionian cities of Sicily; and it was a plausible argument for taking part against Syracuse, that if no power remained capable of balancing hers, she might, at some future period, be inclined both by temper and by blood to unite with Lacedæmon against Athens. Alcibiades proposed, therefore, to send an armament to protect the Egestans, and to take any further measures which might strengthen the Athenian interest in Sicily. The measure was in vain opposed by Nicias, and a decree passed, that a powerful fleet should be despatched thither. This was done; and the armament which sailed from the Peiræus B.C. 415, under the joint command of Nicias, Lamachus, and Alcibiades, was the most splendid that ever left a Grecian port. Popular enthusiasm was strongly excited; the undertaking seemed to promise wealth and victory, and neither public nor private expense was spared to make the equipment as complete as possible. There sailed from Athens 100 ships, containing, besides their crews, 2200 heavy-armed Athenian citizens; and the tale of 134 ships, and 5100 heavy-armed soldiers, besides slingers and bowmen, was made up by the allies and subject-states. But on arriving in Sicily, it was found (as probably Alcibiades well knew) that little help could be had from the Egestans. Nicias was for returning, Lamachus for laying siege at once to Syracuse. Alcibiades proposed to enter into negotiation with all the cities except Syracuse and Selinus, in the hope of securing a powerful party in the island, before commencing hostilities with those two states. This plan was finally adopted; and had the genius of Alcibiades continued to direct it, this unfortunate expedition might perhaps have terminated gloriously for Athens. But party-strife at home led to his recall, and of the two generals who remained, Lamachus, a mere soldier, Nicias timid, and disinclined to the whole business, neither was qualified to execute the plan of their enterprising colleague. But we must return a little in the order of time, to explain the cause of Alcibiades' recall.

It was usual to place a square block of stone, surmounted by a head of Mercury, before the doors of temples and houses in Athens, a relic of more simple times in which the presence of the god was expected to guard the entrance from violence. Of these Hermæ, as they were called, from the Greek name of the god, the greater part were defaced in one night. The next morning anger and tumult spread through the city. The act was generally believed to bode ill to the important expedition to Sicily, then in preparation; it was even thought to indicate a design to overthrow the democracy. High rewards were offered for any information concerning the guilty persons; and it came to light that a party of intoxicated young men had been concerned in the mutilation of a few statues some time before. Alcibiades was implicated in this charge, which, however, was entirely distinct from the act which had given such alarm and offence. But this, and his other irregularities, gave a colour to the accusation, which his enemies laboured to fix on him, of having contrived the mutilation of the Mercuries. He came forward freely and eagerly to court an immediate trial, urging the inexpediency of sending out any man in a command of high importance with such a charge hanging over his head. But the oligarchal party at present possessed the ear of the people, and it did not suit their purpose either to grant this reasonable request, or to deprive him of the command. No immediate investigation was made, and a vote was obtained that he should proceed on the voyage. But the agitation was kept up, and rose to an extraordinary height during his absence, and the influence of his enemies was powerful enough to procure that decree of recall of which we have spoken. Alcibiades obeyed the summons, and quitted the fleet in his own trireme; but believing that his death was resolved, he disappeared at Thurium in Italy, in company with other accused persons, and betook himself first to Argos, then to Sparta.

By the injury which he did to his country after his exile, Alcibiades proved how much he might have done for her benefit, had the command of her yet unbroken resources been continued in his hands. Restrained by no principle of patriotism (a feeling not very common in Greece, where no party hesitated to call in foreign arms to strengthen their own hands), he yet felt it necessary, in offering his services and counsels to Sparta, to make some apology for this step, and, as given by Thucydides, it is a very lame one:—'I love not my country as wronged by it, but as having lived in safety in it. Nor do I think that I do herein go against any country of mine, but that I far rather seek to recover the country I have not. And he is truly a lover of his country, not that refuseth to invade the country he hath wrongfully lost, but that desires so much to be in it, as by any means he can he will attempt to recover it.'—(Thucyd., vi. 92.) The value of his services was soon shown. The Athenians had laid siege to Syracuse, and it seemed probable that it would fall into their hands. But at his suggestion a Lacedæmonian force commanded by a Spartan general was sent to Syracuse; and in consequence of their timely aid the besieging force was totally destroyed. He also advised attacking the Athenians more vigorously at home, and at his suggestion Deceleia, a town of Attica, within fifteen miles of Athens, was fortified and permanently occupied by a Lacedæmonian garrison. Hostile and injurious as this conduct was, his professions of patriotism probably were so far sincere, that he was actuated by no love for Sparta, and no hate for Athens, though altogether careless of all national or individual misfortune, so long as he promoted his own views of returning home in power and authority, and not as an arraigned criminal.

It was the general belief of Greece, that the maritime ascendency of Athens was utterly destroyed by the ruin of the Sicilian armament. The Ionian cities, which had felt the harshness of her command, and for the most part contained a strong oligarchal party, eagerly seized the favourable opportunity of revolt. The Persian satraps, or governors of provinces, on the coast of the Ægean, were also eager to crush a power which, in addition to old grudges, maintained against the barbarians the integrity and independence of many valuable Grecian cities, which otherwise would probably have passed into Persian hands. It so chanced that, B.C. 412, Tissaphernes, satrap of Lydia, and Pharnabazus, satrap of the Hellespontine provinces, both sent to invite the alliance of Sparta. It is not necessary to detail the intrigues by which Alcibiades caused the former to be preferred: at the same time it was determined to support Chios and Erythræ in a proposed revolt. The usual supineness of the Spartan government nearly prevented this important blow being struck, nor would the design have been accomplished but for the activity of Alcibiades, by whom Chios, Erythræ, Clazomenæ, Teos, and Miletus were induced to revolt from Athens, and a treaty, by no means honourable to Sparta, was concluded with Tissaphernes.

In the annual change of Spartan magistrates at the end of the year, those who had been most closely connected with Alcibiades went out of office, and were succeeded by the party of Agis, one of the reigning kings, who had personal reasons for looking on the Athenian refugee with no friendly eye. [See Agesilaus.] The connexion with Persia was utterly repugnant to the principles of Lycurgus's institutions; the terms of the late treaty with Persia were highly objectionable; and in addition to those reasons for disliking the course of policy suggested by Alcibiades, there was ground to suppose that he who had been so ready to ruin his country, would not scruple to betray the interests of his adopted home, and there was something like a certainty that he would betray them if the direction of affairs were taken out of his hands. To prevent this, recourse was had to a measure not unfrequent in Spartan councils, and the Spartan general in Asia received instructions to have Alcibiades assassinated. Aware of his danger, Alcibiades left the camp, and repaired to Tissaphernes. Probably it was his aim from the first to establish an independent interest with the satrap, so as to make himself the channel which should turn Persian gold at pleasure into the treasury of Sparta or Athens, and thus obtain sufficient consequence to prescribe to either party the terms on which his services might be purchased. It was with this view that he recommended to the satrap a line of policy, which should give no decisive advantage to either of the contending parties. By the ruin of Athens his services would become useless to Sparta; by the relieving Athens from the fear of Sparta his restoration to his home would become hopeless.

The exertions of Athens, ever since the fatal expedition to Sicily, had been wonderful, and her success proportionate; but they had nearly drained her treasury, and it seemed impossible to hold out much longer against Sparta, backed by the wealth of Persia. It was probably the knowledge of this which guided the policy of Alcibiades, and induced him to hold out hope of an alliance with Persia, on terms which a few years sooner would have been rejected with scorn. These were, his own restoration, coupled with the establishment of oligarchy. The negotiation was commenced with the citizens in the Athenian army, then quartered in great strength at Samos. A large proportion of the trierarchs, or captains of ships, who, under the Athenian system, were men of wealth, were favourable to the change. When they had secured a decided majority in the army, it was resolved to send delegates to Athens, to acquaint the people with the proposals of Alcibiades, and the opinion of the army that they should be accepted. The deputation succeeded in reconciling the people to the change with singular rapidity, and in return a body of ten commissioners was sent out to treat with Alcibiades and Tissaphernes. But whether the former thought the revolution thus brought about unfavourable to his private views, or that he found it impossible to make Tissaphernes fulfil the expectations of assistance, which he had held out as the price of his return, he so managed matters that the commissioners broke off the conference in anger, convinced that at all events Alcibiades meant nothing friendly to them. Still the revolution proceeded. By the new constitution, the supreme authority was vested in a body of five thousand select citizens, and a council of four hundred was appointed to supersede the old council of five hundred. The council was nominated, but not the select body. No one dared to complain, for the practice of secret murder was carried to a frightful extent, and those who did not favour the government were satisfied to remain quiet, when they saw the numbers who were daily slain without inquiry or notice on the part of the magistrate. But in the absence of the leading oligarchists, the temper of the army at Samos changed. Thrasybulus and Thrasyllus, two officers of high character, but subordinate rank, were appointed to take the command; an oath of adherence to the democracy was exacted from all, and as the general assembly at Athens had been dissolved, the citizens in the army assumed the supreme power, and considered the resolutions of their own assembly as the acts of the commonwealth. One of their first measures was to recall Alcibiades, and appoint him their general. In this capacity he did his country the signal service of preventing a civil war between the oligarchy at home, and the army, who were on the point of sailing to Athens to restore the old constitution by force. Meanwhile a schism had arisen, which led to the desired event without confusion or bloodshed. The violent oligarchists were suspected, and with good reason, of a plot to deliver the city into the hands of the Peloponnesians; a cry was raised to uphold the authority of the five thousand against the four hundred; the supreme authority was vested in the former body, who were appointed to be taken from such citizens upon the muster-roll of the heavy-armed foot as were then in Athens; and one of its first acts was to decree the restoration of Alcibiades, and all who had absented themselves from Athens on account of the mutilation of the Mercuries. This revolution and counter-revolution were comprised in the year 411, four years after the recall and condemnation of Alcibiades.

The promises of Persian assistance, which Alcibiades had made so confidently, were not fulfilled. Tissaphernes had learnt so much from his wily counsellor, that he was as unwilling to break entirely with the Spartans, as formerly with the Athenians. But the able conduct of Alcibiades, seconded by Thrasybulus and Thrasyllus, soon brightened the prospects of the Athenians. At Cynossema (411) the Peloponnesian fleet was defeated; at Abydos, in the same year, a further success was obtained; at Cyzicus (410) a still more brilliant victory was gained, in which every ship of the Peloponnesians was taken or destroyed. In the two following years a train of equally important successes marked the ability with which the Athenian affairs were conducted. Chalcedon, Byzantium, and the whole Hellespont and Propontis were regained to the alliance or subjection of Athens; and thus the control of the Euxine, and the power of levying duties on all ships passing the straits, a very lucrative branch of revenue, was recovered. Alcibiades had hitherto abstained from visiting Athens, though the decree against him had been reversed for four years. He now probably thought that his brilliant successes ensured a favourable reception, and he led home his victorious armament in 407. He was received with distinguished favour, elected commander in chief, with a new title, and apparently with greater powers than those belonging to the office of strategos, and soon found an opportunity of gratifying the people, by conducting the annual procession from Athens to Eleusis, under safeguard of the army, which had never ventured to traverse the country since the establishment of a Laconian garrison in Deceleia.

After staying four months in Athens, he returned to the scene of action. The Athenians seem to have thought that he could command success at will, and grew angry that no brilliant success immediately waited on his arms. The defeat at Notium, where his second in command gave battle during his absence, contrary to his commands, completed their alienation. He was superseded, and the command vested in a board of ten. It is not said that any steps were taken against him, but he evidently thought it would be unsafe to return to Athens, and retired from the fleet to the Thracian Chersonese, where he had large possessions. Here the history of his public life ends, and of his future history few certain notices are preserved. He still resided in the Chersonese in 405, and endeavoured to prevent the defeat of Ægospotamoi, which he foresaw from the negligence and incompetence of the Athenian commander; but his interference was disregarded. Athens was taken in the following spring, and Alcibiades, thinking himself no longer safe in the Chersonese, retired into Bithynia, with the intention, it is said by Plutarch, of repairing, like Themistocles, to the Persian court, to request assistance in restoring the independence of Athens. During his abode in Asia, his house was surrounded and set on fire by a body of armed men. They dared neither enter the house, nor await the assault of Alcibiades, supported only by his servants, but overwhelmed him with missile weapons. He appears to have died in 404, being then at least forty-four years of age.

The intellectual eminence and moral depravity of Alcibiades are alike placed beyond the reach of doubt. His conduct however subsequent to his recall seems to have been unexceptionable; and the ingratitude of his countrymen was justly punished by the issue of the war. The rashness and petulance of his youth were tempered by experience, and his measures appear to have been equally vigorous in execution, and prudent and mature in conception. Singularly gifted with the faculty of adapting himself to all men, it was observed that, when at Sparta, he equalled the Spartans in austerity of manners; in Asia surpassed the pomp of the Persians themselves; and he is said, by Plutarch, to have been materially indebted to his powers of pleasing in society, which were such, that 'no man was of so sullen a nature but he would make him merry, nor so churlish but he would make him gentle.' Had he been suffered to retain the direction of the counsels of Athens, there can be no doubt but that the temporary fall of that city would have been long delayed, and a strong probability that the event of the Peloponnesian war would have been altogether different. (Thucydides; Plutarch, *Life of Alcibiades.*)

ALCOHOL. This word is probably of Arabic origin, and is the chemical name of what is sometimes termed *ardent spirit*. It is a fluid compound of oxygen, hydrogen, and carbon, not obtainable by direct chemical action, but produced by the vinous fermentation, during which the elements separated from combination re-unite in new proportions to form it. Alcohol is the intoxicating principle of beer, wine, and fermented liquors in general; and when they are subjected to distillation, the alcohol and a considerable quantity of water are vaporized and condensed together. The distilled products have different names and properties according to the substances yielding them: thus, brandy is obtained from the fermented and distilled juice of the grape; rum from that of the sugar-cane; whiskey, and what is termed spirit of wine, are usually obtained from barley, which is generally malted previously to fermentation.

On account of the chemical affinity existing between alcohol and water, it is not possible to obtain the former free from the latter by simple distillation, though frequently repeated; the specific gravity of the product is never less than 0·825, and the rectified spirit of wine of commerce and of the *London Pharmacopœia* has a specific gravity of 0·835.

It will be more particularly mentioned under FERMENTATION, that sugar, during its operation, is decomposed, and that its elements, which are the same as those of alcohol, combine to form two new compounds, viz., alcohol, the principal part of which remains in the fermented liquor, and carbonic acid, which is mostly evolved in the state of gas. Sugar is composed of one atom or equivalent of each of its constituent elements, and when it is fermented three atoms appear to be decomposed; the whole of the hydrogen taking two-thirds of the carbon, and one-third of the oxygen of the decomposed sugar, they unite to form alcohol; while the remaining atom of carbon and two atoms of oxygen combine and yield carbonic acid; the annexed illustration will, perhaps, render these changes more intelligible:

Three atoms of Sugar = 3 at. hydr. 3 at. carb. 3 at. oxyg. *decomposed.*
One atom of Alcohol = 3 at. hydr. $\underline{2}$ at. carb. $\underline{1}$ at. oxyg. *formed.*

One atom of Carbonic Acid = 1 at. carb. 2 at. oxyg. *formed.*

According to this statement it is evident that alcohol is constituted of

three atoms of hydrogen 1 × 3 = 3
two atoms of carbon 6 × 2 = 12
one atom of oxygen = 8

atomic weight = 23

The methods by which this result was obtained, will be stated presently; and it is to be observed, that this is the composition of what is sometimes termed *absolute alcohol*, that is, perfectly free from water; and various methods for procuring it in this state have been proposed. According to M. Sœmmering, the water may be entirely separated from alcohol by the following process: put the spirit into an ox's bladder coated with isinglass, and expose it to a temperature of 105° to 120°; the interior of the bladder is moistened by the water of the spirit, and whilst the exterior coat dries, fresh portions of water continue to penetrate the bladder and to evaporate from its surface, while but little of the alcohol escapes with it. Spirit put into a wide-mouthed bottle and tied over with bladder suffers a similar evaporation of the water, and concentration of the alcohol. Geiger and Planiava assert, however, that the remaining alcohol still retains three per cent. of water. Pajot Descharmes proposed to place spirit in a flat vessel beside fragments of chloride of calcium under a closed receiver; the air contained in this soon becomes loaded with the vapour rising from the spirituous liquor, the salt combines with it, and the alcohol is gradually concentrated; some, however, is lost, being vaporized and condensed with the water. Berzelius, *Traité de Chimie*, t. vi. 448.

Dr. Graham proposes a process upon a similar principle, viz., that of placing a shallow vessel of spirit over another containing coarsely-powdered lime, under a bell glass, upon the plate of an air-pump; the air is exhausted till the alcohol begins to boil, and the lime absorbs the water onlv of the vapour which rises. If sulphuric acid be substituted for lime, then both the water and spirit evaporate and are totally absorbed. *Edin. Phil. Trans.*, 1828.

Although these are curious processes, yet they are scarcely applicable on an extensive scale. The best methods depend upon adding to the spirit some substance which has affinity for the water, and none or but little for the alcohol; thus carbonate of potash is a deliquescent salt, and has consequently great affinity for water, but unlike most salts of this description, it has no affinity for alcohol, and is totally insoluble in it. When then dry carbonate of potash in powder is put into rectified spirit of wine of specific gravity 0·835, the water which it contains dissolves the alkaline salt, and forms a dense solution, on which the alcohol floats, not, however, quite free from water, for when separated and distilled, its specific gravity is reduced only to 0·815, and therefore it retains about 5 per cent. of water.

Caustic potash, having still greater affinity for water than the carbonate, has been recommended to be substituted for it; but it appears to alter the properties of the alcohol to a certain extent. Lime also has been used; it is to be powdered, mixed with the spirit, and put into a stopped bottle and occasionally shaken for three or four days; after which the clear liquor is to be poured off and cautiously distilled.

Chloride of calcium, (sometimes called dry muriate of lime,) which has been melted so as to render it free from water, is an extremely deliquescent salt, and is more powerful than most substances in separating water from alcohol. Mix equal weights of spirit and pieces of the fused chloride in a stopped bottle; when the salt is dissolved, pour off the clear solution into a distilling apparatus, and continue the operation until the product is equal to half the bulk of the spirit employed. If the distillation be properly conducted, the alcohol obtained is perfectly free from water, and has the following properties. It is a limpid, colourless liquid, of an agreeable smell, and a hot pungent taste. Its specific gravity is 0·791 at 68°, or 0·7947 at 59°. It has never been frozen, although exposed by Mr. Walker of Oxford to 91° below zero, or 123° below the freezing point of water. It is extremely volatile, producing considerable cold during evaporation; the degree of cold is proportional to its purity. Heat expands alcohol in a greater degree than it does water, for 100,000 volumes become 104,168 by being heated from 32° to 100°; whereas an equal bulk of water heated to the same degree is increased only to 100,908. Under the average atmospheric pressure alcohol boils at about 173°, but in the vacuum of the air-pump, ebullition occurs at 60° and even below it. In becoming vapour, alcohol absorbs only 0·436 of the heat required to evaporate an equal weight of water; and, according to Gay-Lussac, (*Ann. de Chim. et de Phys.* xv.) the density of the vapour of anhydrous (waterless) alcohol compared with that of atmospheric air, is as 1613 to 1000. When the vapour of alcohol is strongly heated, as by being passed through a red hot porcelain tube, it is decomposed, and there are obtained, carburetted hydrogen, oxide of carbon, and a small quantity of charcoal. Alcohol, and the vapour arising from it, are extremely inflammable; it burns with a lambent flame, the colour of which depends upon the strength of the alcohol; the blue tint prevails when it is strong, and the yellow when weak. Although the flame of alcohol yields but little light, its heat is intense; it burns without any smoke, and the only products of the combustion, under common circumstances, are water and carbonic acid. When, however, alcohol is burned in the lamp without flame, in the wick of which a platina wire is kept ignited, then acetic acid also is produced. It has been also called *lampic acid*, and appears to contain resinous matter, to which some of its peculiar properties are owing. There are several substances which communicate colour to the flame of alcohol: boracic acid and cupreous salts impart green, barytic salts yellow, and the salts of strontia an intense and beautiful red colour.

Alcohol may be fired by the electric spark, which when passed through a mixture of the vapour of alcohol and oxygen gas, causes it to it take fire and explode violently. The vapour of alcohol requires three times its volume of oxygen gas to be perfectly burned, and it then yields water and twice its volume of carbonic acid gas; theoretically, 23 parts of alcohol = 1 atom should yield 27 parts = 3 atoms of water; but according to Saussure a larger quantity is obtained.

At low temperatures, alcohol suffers but little change by exposure to the air; the portion which does not evaporate is rendered weaker by attracting water, and it absorbs at the same time some air. According to Saussure, alcohol and water take up similar proportions of oxygen and nitrogen, but the former fluid dissolves 0·1625 of its volume of oxygen, while water takes up only 0·065; it is on this account that there is always a slight disengagement of gas when these liquids are mixed, part of the oxygen contained in the spirit being expelled by the water.

Alcohol has great affinity for, and readily mixes with water in all proportions, and during their combination heat is excited; if, for example, equal measures of water and of alcohol of specific gravity 0·825, both at 50°, be suddenly mixed, the temperature is raised to 70°, and the specific gravity of the mixture when cooled exceeds its calculated density; if, however, the alcohol be weak, then, although heat is excited, the mean density is diminished.

The following table, by Gay-Lussac, shows the quantity of absolute alcohol in mixtures of alcohol and water of different densities, at 59°.

Alcohol.	Specific Gravity.
100	0·7947
95	0·8168
90	0·8346
85	0·8502
80	0·8645
75	0·8799
70	0·8907
65	0·9027
60	0·9141
55	0·9248
50	0·9348
45	0·9440
40	0·9523
35	0·9595
30	0·9656

The solvent power of alcohol is great; and it has been long known and extensively applied. Dr. Graham (*Trans. Royal Soc. Edin.*,) has shown, that, like water, it combines with bodies in definite proportions; these compounds he terms *alcoates;* not many of them have been formed, and they were obtained simply by dissolving the salts constituting their base, and previously rendered anhydrous, in absolute alcohol, with the assistance of heat. On cooling, the alcoates were deposited in the solid state; the crystallization was generally confused, but in some cases regular forms appeared. The crystals are transparent, soft, and easily fusible by heat in their alcohol of crystallization; their formation is prevented by the presence of a small quantity of water. Chloride of calcium forms an alcoate consisting of 2 atoms of the salt and 7 of alcohol; nitrate of magnesia 1 atom salt + 9 atoms alcohol; alcoate of nitrate of lime consists of 2 atoms salt and 5 atoms alcohol. Several metallic salts were also converted into alcoates and analysed by Dr. Graham; the alcohol of some alcoates is retained with so great force of affinity as not to be expelled at a temperature of 400° to 500°.

Alcohol is capable of dissolving the resins, and many similar bodies, upon which water has no action; hence its use in varnish-making. With the fixed oils, except castor oil, it does not readily unite; but it dissolves the essential oils and camphor with great facility, and hence its use in pharmacy and perfumery. Some substances which are soluble in water are precipitated from it by alcohol—gum, for example; while, on the other hand, water precipitates resinous bodies from solution in alcohol. Alcohol combines with sulphur and phosphorus, but not with the earths nor their carbonates: it dissolves sugar, soap, the oxalic, tartaric, gallic, benzoic, and some other acids. Alcohol is largely used in the preparation of various kinds of æther, as already described. The results of its action with sulphuric acid are very different according to circumstances: thus, by varying the proportions, we may procure sulphovinic acid, æther, oil of wine, or olefiant gas As it remains fluid at the lowest temperatures, it is advantageously employed in filling thermometer tubes, in experiments on artificial cold; its antiseptic properties are great, and hence its use in preserving anatomical preparations; on account of its ready inflammability, the purity, and the intense heat of its flame, it is conveniently, but not economically, employed in chemical lamps, usually termed *spirit lamps.*

It readily dissolves ammoniacal gas; and as the caustic alkalis, potash and soda, are taken up in large quantity by alcohol, and as it does not dissolve their usual impurities, the solution, by distillation, yields these alkalis in a state of great purity. In chemical investigations it is frequently employed to separate various salts, both of which are soluble in water, and only one in alcohol: thus sea-water contains both sulphate and muriate of magnesia; and the latter only being soluble in alcohol, it affords a ready method of separation.

Although we have mentioned the composition of alcohol, we have not yet stated the modes in which the analyses have been performed. Saussure (*Nicholson's Journal*, xxi.) passed the vapour of alcohol through a red-hot porcelain tube, terminating in a glass tube, six feet long, and surrounded by ice: all the products were carefully collected and analyzed; the result was, that 100 parts of alcohol consist of

Hydrogen . .	13·70
Carbon . . .	51·98
Oxygen . .	34·32
	100·29

Dumas and Boullay (*Ann. de Chim. et de Phys.*, t. xxxvi) have since analyzed alcohol by passing it over ignited oxide of copper; they obtained

Hydrogen . .	13·31
Carbon . . .	52·37
Oxygen . .	34·61
	100·

A compound of 3 atoms of hydrogen, 2 of carbon, and 1 atom of oxygen, already stated as the atomic constitution of alcohol, on the authority of the abovenamed chemists, would give, in 100 parts,

Hydrogen . .	13·04
Carbon . . .	52·17
Oxygen . .	34·79
	100·

It will further appear by calculation, that the vapour of alcohol is equivalent to a compound of one volume of aqueous vapour and one of olefiant gas, condensed into one volume.

ALCORAN, or ALKORAN. [See KORAN.]

ALCOVE. This term is found in most of the modern European languages, and is similarly applied throughout to a recess in a room intended for a bed, or in which a bed may be placed. It is not, however, necessarily restricted to this meaning; and in England, where such recesses are not so common in bed-chambers as they are in some other countries, and particularly in Spain and France, alcove is applied to a similar recess in a room of any kind, and yet more commonly to an ornamental covered garden-seat. What, indeed, in an ecclesiastical or public civil structure would be denominated a tribune, or an apsis, is in domestic edifices called an alcove.

The term is originally from the Arabic language, in which it means, simply, the cave, hollow, or recess; and it passed into the other European languages through the Spanish, which acquired it during the occupation of a part of Spain by the Arabs.

ALCUIN, or, as he called himself in Latin, Flaccus Albinus, was one of the most learned persons of the eighth century. He appears to have been born about the year 735, and probably in the city of York or the neighbourhood, though some authorities make him a native of Scotland. He tells us himself, he received his education at York, where he had successively for his masters Egbert and Elbert, who were afterwards successively archbishops of that see. He there acquired a knowledge of the Latin language, and some acquaintance also, it would appear, with the Greek and the Hebrew. He afterwards became himself master of the school, and taught with much reputation. He was also appointed keeper of the library which Egbert had founded in the cathedral; of the contents of which he has given us a minute and curious account in one of his poems. Being equally eminent for piety as for learning, he was likewise ordained a deacon of the cathedral; and we may mention here, that through modesty, as is stated, he never afterwards would accept of any higher rank in the priesthood. Having been sent by Elbert's successor, Enbalde, to Rome to procure for him the pallium, Alcuin on his return passed through Parma, where the Emperor Charlemagne then was. At the invitation of the emperor he consented, as soon as he should have executed his mission, to come to France; and accordingly, in the same year, (780,) he proceeded to that country. Soon after his arrival, his patron bestowed upon him the abbeys of Ferrières in the Gâtinois, and of St. Loup at Troyes, and the little monastery of St Josse in Ponthieu. But the principal occupation of Alcuin was as a public teacher of what was then called the *totum scibile*, or entire circle of human learning. In this capacity he was frequently honoured with the attendance at his lessons of the emperor himself, his children, and the lords of the court. The place where he principally taught was, probably, Aix-la-Chapelle, which was the chief residence of the emperor. The school thus established by Alcuin is considered by French antiquaries as the germ from which the University of Paris originated; and the example and exertions of this foreigner were undoubtedly mainly instrumental in rekindling in the country of his adoption the extinguished light of science and literature. Much of Alcuin's time was also occupied in theological controversy, and other labours connected with his clerical calling. In 796, on the death of Ithier, abbot of St. Martin of Tours, the emperor gave him that abbey also; and some time after, having obtained leave to retire from court, he established a school here, which soon became greatly celebrated. In his old age Alcuin gave himself up almost exclusively to theological studies; and besides composing many treatises in that department, copied with his own hand the whole of the Old and New Testament, introducing numerous corrections as he proceeded. This edition came to be looked upon as a standard, and many transcripts were made from it. There is still to be seen in the library of the Fathers of the Oratory of St. Philip of Neri, at Rome, a Bible, which is believed to be, as some verses written on it state, a copy given by Alcuin to Charlemagne. Alcuin died on the 19th of May, 804, and was buried in the church of St. Martin. Over his remains was inscribed, on a plate of copper, an epitaph composed by himself, of which the following are two of the lines:

Quod nunc es, fueram, famosus in orbe, viator;
Et quod nunc ego sum, tuque futurus eris.

Of the writings of Alcuin several have been printed separately, both in France and England; but the first edition of his collected works was that published at Paris in 1617, by André Duchèsne, (Andreas Quercetanus,) in one volume, folio. A much more complete edition, however, appeared at Ratisbon, in two volumes, folio, in 1777, under the superintendence of M. Froben, the Prince Abbot of Ratisbon. It contains many pieces which had never before been published, but which were found in manuscript in the libraries of France, England, and Italy.

ALCYONEÆ (*Savigny*), a group of marine productions somewhat similar to the sponges, but more distinctly belonging to animated nature. We are indebted to Pallas, Gaertner, Savigny, Spix, and Lamouroux, for what is known of their singular structure. Both in the fresh and the dried state they are of much greater specific gravity and solidity than the sponges, and frequently emit a disagreeable odour. They vary much in form, some being in a shapeless mass or crust, and others lobed, fingered, branched, or with rounded mushroom-like projections. The interior substance is spongy or corky, surrounded by tube-like rays inclosed in a leathery sort of membrane.

The tentacules or arms (*tentacula*) of the animal inhabiting these productions are eight or more, which distinguishes them from the complex *Ascidiæ* of Savigny, which have six. These are almost all pectinated and furnished with papillæ. The contractility of these arms varies with the age of the individual, as well as with the season and the particular exposure.

The cells in which the animals lodge are round, unequal in diameter, and about a sixth or a fifth of an inch in depth, separated from each other by thin partitions, which are rendered opaque by a great number of solid globules.

The alcyoneæ are found in all seas and at various depths, subsisting, it would appear, on marine plants. They do not, however, seem to like places which are often left dry by the ebbing of the tide, and hence we have never met with them recent, except about the low water-mark of spring-tides; and they seem to delight in places sheltered by rocks from the sweep of currents, or the agitation of the waves, and where the light is rather obscure. They are found, therefore, to be most numerous in deep water.

M. Lamouroux makes nine genera, of which we shall here only notice the three, whose names are formed from that of the group—the alcyonium, the alcyonella, and the alcyonidium.

Alcyonium lobatum, or *Lobularia digitata*, which is not uncommon in the European seas, and is frequently found on the British coasts. It consists of a tubular mass contracted at the base, and terminating in a varying number of finger-shaped lobes. The colour varies from white tinged with pink to a very deep orange, which forms a fine contrast with the invariable white colour of the inhabiting animals.

Alcyonella stagnorum, a fresh-water species, found in ponds and springs about Paris, by Bosc and Bruguière, attached to aquatic plants. It has been ranked by Lamarck among fresh-water sponges, but, as M. Lamouroux thinks, improperly.

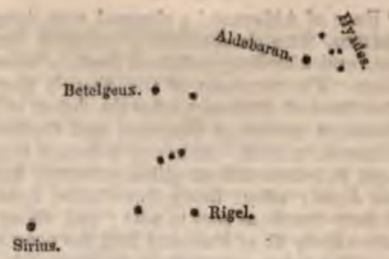
Alcyonidium gelatinosum is very variable in form; thick, branchy, the branches being blunt. It is found attached to solid sands or upon rocks by means of a sort of paste, from which arises a short cylindrical footstalk about the thickness of a crow's quill. It is phosphorescent in certain seasons. It only lives in deep water, and is never found except when drawn up in the nets of fishermen.

ALDBOROUGH, a parish in Yorkshire, with a population of 2447 inhabitants, comprehending the boroughs of Aldborough and Boroughbridge, on the south bank of the Ure, both disfranchised by the Reform Bill. Aldborough is a place of great antiquity, and has been supposed by some to have been the capital of the Brigantes, the most powerful of the nations of Britain before the conquest of that people by the Romans. But, however this be, the remains, which attest the former greatness of the place, go no higher than the Roman dominion. Under that people Aldborough had the name of Isurium, which it lost upon the invasion of the Saxons, who gave it the appellation of Ald-burgh (Old Borough or Town). The ancient walls are stated by Drake (*Hist. and Antiq. of York*) to have been about a mile and a half in circuit and inclosing a space nearly square. Many Roman antiquities have been dug up, including coins, signets, pieces of urns, &c.: and there have been found the remains of aqueducts cut in great stones and covered with Roman tile, and of a temple built on what is called the Borough Hill; also several mosaic pavements. The remains of Isurium have served for the pavements and the walls of out-buildings, both in Aldborough and Boroughbridge, which latter place, about half a mile to the west of the former, rose on its decline.

Three remarkable obelisks are yet remaining to the west of Boroughbridge, and are therefore nearer to it than to Aldborough; but they are connected in their origin with Isurium. Antiquaries do not agree whether they are British or Roman monuments. They are vulgarly called the Devil's Arrows, and are rough blocks of coarse rag-stone. The middle one is above thirty feet from the top to the base, which is six feet below the surface.

Aldborough contains only 620 inhabitants, and is about sixteen miles N.W. of York. [See BOROUGHBRIDGE.] There is another place of the same name on the coast of Suffolk, once a town of considerable importance, but reduced by the encroachments of the sea, which has washed away the market-place and a whole street during the last century. It was also disfranchised by the Reform Bill. The town is pleasantly situated between the river Alde and the sea, and is much inhabited by fishermen, pilots, and other seafaring people. Some corn is exported, and the curing of sprats and herrings carried on to a considerable extent. It has been frequented of late as a bathing place. Population, 1341. Distant from Ipswich twenty-five miles, from London ninety-four.

ALDE'BARAN, the Arabic name of a large and bright star of the first magnitude, called in modern catalogues α Tauri, situated in the eye of the constellation Taurus, whence it is called also by the Arabs *Ain al Thaur*, the bull's-eye. It is the bright star in the group of five, known by the name of the HYADES, on which account it is called by Ptolemy ὁ λαμπρὸς τῶν Ὑάδων. Its light is rather reddish, and of late years it has become remarkable as having been frequently occulted by the moon, and having exhibited the curious phenomenon of projection on the moon's disk. [See OCCULTATION.] It is easily found in the heavens by the following directions. If a line be drawn through the three conspicuous stars forming the belt of Orion, *towards the head*, it passes just below Aldebaran and the Hyades; if *towards the feet*, it passes through Sirius, which is about the same distance from the belt as Aldebaran. This is shown in the following diagram.—



We subjoin the right ascension and declination of Aldebaran at the beginning of the years 1800 and 1834. The difference is owing to the precession of the equinoxes, as this star has no perceptible proper motion.

Date.	Right Ascension. h.	m.	s.	North Declination.		
1800.	4	24	24	16°	5′	52″
1834.	4	26	24·2	16	10	9·2

Annual motion in right ascension . 3^{s} ·4262
———————— declination . . 7″ ·963

ALDER. [See ALNUS.]

ALDERMAN. This word is from the Anglo-Saxon *ealdorman* or *eoldorman*. The term *ealdorman* is composed of *ealdor*, originally the comparative degree of the adjective *eald*, 'old,' and *man*; but the word *ealdor* was also used by the Anglo-Saxons as a substantive, and as such it was nearly synonymous with the old English term *elder*, which we so often meet with in the English version of the Bible. A prior of a monastery was called *Temples-ealdor*; the magistrate of a district, *Hiredes-ealdor*; the magistrate of a hundred, *Hundredes-ealdor*, &c. In a philological sense, the terms *ealdor* and *ealdorman* were synonymous and equivalent; but in their political acceptation they differ, the former being more *general*, and, when used to express a specific degree, commonly denoting one that is lower than *ealdorman*. In both terms the notion of some high trust or office, as well as that of rank or dignity, seems to be inherent; but *ealdorman* at the same time expressed a definite degree of *hereditary* rank or nobility which *ealdor* does not so necessarily imply. Princes, earls, governors of provinces, and other persons of distinction, were generally termed Aldermen by the Anglo-Saxons. But besides this general signification of the word, it was also applied to certain officers in particular; thus there was an Alderman of all England, (*aldermannus totius Angliæ*,) the nature of whose office and duties the learned Spelman says 'he cannot divine, unless it corresponded to the office of Chief Justiciary of England in later times.' There was also a King's Alderman, (*aldermannus regis*,) who has been supposed to have been an occasional judge, with an authority or commission from the king to administer justice in particular districts: it is very possible, however, that his duties may have resembled those exercised by the king's sergeant in the time of Bracton, when there are strong traces of the existence of an officer so called, appointed by the king for each county, and whose duty it was to prosecute pleas of the crown in the king's name. Spelman, however, doubts whether the King's Alderman may not have been the same person with the Alderman of the county, who was a kind of local judge, entrusted, to a certain extent, with the administration of civil and criminal justice. Besides those above mentioned, there were also Aldermen of cities, boroughs, and castles, and Aldermen of hundreds, upon whose particular functions it would, at this distance of time, be useless to speculate.

In modern times, Aldermen are individuals invested by charter with certain privileges and duties in municipal corporations, either as civil magistrates themselves, or as associates to the chief civil magistrates of cities or corporate towns. These privileges and duties, and also the rules which regulate the election and promotion of these officers, are of course as various as the provisions of the different charters under which they act.

ALDERNEY, or AURIGNY, one of the islands in the English Channel, lying in the bay of Avranches formed by the peninsula of Cotantin, (which constitutes part of the department of La Manche,) in Normandy, and the coast of Brittany. It is the nearest of this group of islands to the French coast, being about seven miles west of Cape La Hogue, in Normandy, from which it is separated by the strait or 'Race of Alderney,' a channel very dangerous in stormy weather, from its conflicting currents, but safe at other times, and affording sufficient depth of water for the largest ships. The remnant of the French fleet escaped through the Race of Alderney, after the defeat of Tourville by the combined navies of England and Holland, under Admiral Russell, in 1692. Alderney is distant from Guernsey (N.E. by N.) about fifteen miles, or twenty from port to port; from Jersey about thirty-three miles from coast to coast, and forty-five from port to port; and about fifty-five or sixty miles S. by E. of Portland Bill, the nearest point of England. The communication with Guernsey is much more frequent and regular than with Jersey. Alderney possesses four vessels, the total tonnage of which is only 150. During the oyster season some of them ply on the French coast; but two, at least, run regularly to Guernsey, paying a visit occasionally to Jersey.

The island is about 3¾ miles long, from N.E. to S.W.; about 1⅜ broad; and about 8 miles in circuit. The S.E. coast is formed by picturesque and lofty cliffs, from 100 to 200 feet high; but as the island shelves towards the N.E. the coasts in that direction are of less elevation, and more indented with small bays, such as those of Longy or Câtel (query, Châtel—Castle?) bay on the E., and of Braye on the N.W. The last affords good anchorage, and near it is the only harbour in the island, that of Crabby, which, however, is fit for none but small vessels. The approach to the island is dangerous in bad weather, in consequence of the rapidity and diversity of the currents, and the rocks and islets which surround it in every direction. Six miles, or thereabouts, to the west lies a cluster of rocks, called 'The Caskets,' included in the compass of a mile, and having, on the S.W. side, a natural harbour, in which a frigate may shelter as in a dock. The light-houses on these rocks are three in number, and so situated as to form a triangle. They are called St. Peter, St. Thomas, and Donjon. The platform of each is sheathed with copper, as are also the staircases, to prevent their destruction in case of fire. The men who have the care of the lights keep a journal of the wind and weather; they have a telegraph for the purpose of communicating with the agent of the Trinity House, (which corporation has the charge of the light-houses,) also a little brewery and a forge. Their salary is about fifty pounds per annum. Upon these rocks, or others in the vicinity, Prince William, only son of Henry I., perished by shipwreck, in the year 1119; and in 1744 the Victory, of 110 guns, was lost, with 1100 men.

The climate is mild and healthy; the soil sandy, gritty, and gravelly round the coast, but in the valleys it is very fertile, producing excellent corn and the best kind of potatoes, much superior to those of Jersey or Guernsey. In the meadows they grow rye-grass and clover, which give excellent milk and butter. The grass lands occupy about one-third of the area of the island. The land is generally elevated, but consists both of high and low tracts; a good supply of excellent water is procured in every part of the island. The Alderney cows maintain their reputation: they are easily distinguished from those of the neighbouring islands, by being remarkably small and straight in the back.

The population of Alderney is decreasing by emigration, which is attributed to want of trade and employment. The majority of the emigrants go to Guernsey and Jersey; some to America. The population was, in 1813, 1308; in 1821, 1151; in 1823, 1066; and in 1831, 1045, of whom 447 were males, and 568 females. The number of inhabited houses, in 1831, was 217; of houses uninhabited or building, 58; and of families, 246. Of these last, 79 were employed in agriculture, 60 in trade and handicrafts, and 107 were not included in either of these classes. The inhabitants are a good deal engaged in fishing, to which their insular situation and the abundance of fish supply an ample inducement. 'The town,' which is known simply by that designation, is situated in a beautiful valley nearly in the centre of the island, with roads leading to Braye and Longy Bays, and comprehends all the houses in Alderney. It is partly paved, but presents, as may be supposed, few buildings worthy of notice. The church is dedicated to St. Anne, and the parish is in the diocese of Winchester. The government-house is near the church. An ancient monastery at Longy Bay has been made to serve the purpose of a barrack in time of war, and a depôt for military stores and an hospital since the conclusion of the peace. The island contains the decayed foundations of a castle which bears the name of 'Essex farm,' from having been for a time the residence of the Earl of Essex, the favourite of Queen Elizabeth.

As the islands of Guernsey and Jersey, with their dependencies, formed part of the Duchy of Normandy, and are therefore the relics of the extensive domains which the Kings of England once possessed in France, they are subject to the crown, but not, unless especially mentioned, to the acts of the legislature of this country. [See Guernsey.] Alderney is a dependency of Guernsey. The civil power is vested in six jurats, who are chosen by the people, and hold their offices for life, unless removed for misbehaviour. These, with twelve 'Douzainiers,' representatives of the people, form a sort of local legislature, the douzainiers having only the power of deliberating, not of voting; neither is this power possessed by the governor of Guernsey or his lieutenant, though the presence of one of these is requisite. The same jurats, the eldest acting as president, with the king's procurator and advocate, (the last a barrister,) and the *greffier*, or registrar, nominated by the governor, constitute the court of justice; from which, however, an appeal lies to the royal court at Guernsey, and, in the last resort, to the king in council. In criminal cases, the court at Alderney only collects and transmits evidence to the superior court at Guernsey, where the sentence is pronounced and carried into execution. The local militia is composed of four companies of infantry and a brigade of artillery. The men are furnished with clothing and accoutrements at the cost of the government, but receive no pay when called out. They are excellent marksmen. The officers are appointed by the Lieutenant-Governor of Guernsey. The militia and regular troops together may amount to 300 men.

The inhabitants appear to have embraced the Protestant religion about the time of the Reformation in England: at present they are about equally divided between the Establishment and the Wesleyan Methodists, who have a chapel. Persons quite uneducated are unknown. All speak and write either French or English. The last is spoken by about half, and understood by all. There are three week-day schools—one private, one maintained by John Le Mesurier, Esq., and one by the Rev. Mr. Lys, the rector: also two Sunday schools connected with the two places of worship.

Alderney was called Riduna by the Romans. The Normans settled here at an early period; and it has been observed, that the island remained under the English monarchs, who were also Dukes of Normandy, when their continental dominions were lost. Few or no antiquities are found excepting the castle and monastery above noticed. In April, 1832, seven stone coffins, one of them containing some human remajns, were dug up, and have been supposed to point out the site of the ancient burial-ground of the island. There are, at different spots on the coast, two stones wrought by nature in the shape of a chair. One on the N.W. of the island, is called 'the Monk's Chair;' the other, on the S.W., commonly visited by strangers, is called 'The Lover's Seat.' It lies in 49° 45′ N. lat., 2° 13′ W. long. [*Communication from Jersey*, &c.]

ALDINE EDITIONS. [See Manutius.]

ALDROVAND (ULYSSES), the most celebrated naturalist of the sixteenth century, was born at Bologna in 1527, where he died the 4th of May, 1605, at the age of seventy-eight. He was of a noble family, and on the title-page of his posthumous works he is designated a patrician; on those published by himself he is termed philosopher, physician, and professor of natural history in the gymnasium of Bologna. Nothing seems to have been recorded of his early studies, and but few incidents of his after life. It is only known that he visited several parts of Europe in quest of knowledge in his favourite science. According to M. Aubert le Mire, he gave a painter whom he employed in drawing specimens a yearly salary of two hundred crowns for upwards of thirty years, and engaged as engravers, Christopher Coriolanus, Lorenzo Bennini, and others. The expenses which he incurred in this way, as well as in the purchase of specimens, exhausted his fortune; and it is reported he was so much reduced in circumstances, that having become blind in his old age, he was compelled to go into the hospital of Bologna, where he died. This, however, has been doubted; but the only grounds alleged for the doubt are, 'that it is not probable the senate of Bologna, to whom he bequeathed his cabinet and his manuscripts, and who appropriated a considerable sum to continue the publication of his works after his death, would have suffered him to want during his lifetime; while his widow even expressly mentions, in the dedication of one of these volumes, that he was honoured and upheld by the magistrates.' (*Biog. Universelle*, art. ALDROVAND.) But so far from these circumstances being improbable, as this writer supposes, the whole tenor of biographical history renders it exceedingly probable that Aldrovand might have been neglected during life, and honoured after his death. In the volume published by the widow, we have found no dedication as is above stated; except we consider as such the words on the title-page, '*Ad illustrissimum Senatum Bononiensem*;' and it would surely be an extraordinary thing to construe the preposition '*ad*' into 'honoured and upheld.'

His works on natural history are comprised in thirteen folio volumes, in Latin, of which he himself only published four, namely, three upon Birds, dated 1599, 1600, and 1603, reprinted at Frankfort in 1610; and one upon Insects in 1602. In 1606, immediately after his death, his widow published a volume on Exsanguineous Animals, including Shells and Corals. The subsequent volumes on Quadrupeds, Serpents, Monsters, Minerals, and Trees, were published at the expense of the senate of Bologna, under the superintendence of the professors in the gymnasium—Cornelius Uterverius, a Dutchman; Thomas Dempster, a Scotsman; Bartholomew Ambrosinus of Bologna, and Ovid Montalbanus of Bologna.

It is difficult to procure a uniform edition of all the thirteen volumes; and the one on Minerals is rare.

The merits of the author have been, in our judgment, greatly misrepresented by writers on natural history. 'We can only,' says the writer of his life in the Biographie Universelle, 'consider the books of Aldrovand as an enormous compilation without taste and without genius, while the plan and manner of them are in a great measure borrowed from Gesner. Buffon says, with reason, that they would be reduced one-tenth if all the inutilities and things foreign to the subject were expunged. "On the subject of the cock and bull," adds this great naturalist, "Aldrovand tells us all that has ever been written about cocks and bulls;—all the ideas which the ancients entertained of them; all that has been imagined of their virtues, character, and courage; all the circumstances in which they have been employed; all the tales which old women have told of them; all the miracles which they were made to perform in the mythological ages; all the subjects of superstition which they have furnished; all the comparisons which poets have drawn from them; all the attributes which have been accorded to them: all the representations of them in hieroglyphics and heraldry; and in a word, all the histories and fables which have ever been related on the subject of cocks and bulls."'

Now so far from this copiousness of illustration being an objection, it is to us one of the greatest recommendations of the works of Aldrovand, without whose aid the works of Buffon himself would have frequently been meagre and imperfect. The worst of it is, that by thus fixing on Aldrovand the character of a retailer of fables, one of his chief merits is quite thrown into the shade:—we allude to his very extensive personal observations, and his numerous dissections, with his consequent corrections of errors in preceding naturalists, particularly Aristotle, Albertus Magnus, and Gesner. It is singular that he uniformly terms Gesner 'Ornithologus,' and never once, so far as we have observed, gives him his own name; probably because, while he gives him all due praise, he often corrects his mistakes, and might dislike to appear personal.

Several specimens from his cabinet are still to be seen at the Institute of Bologna; but his numerous MSS. were removed to Paris by Napoleon, and we do not know whether they have been restored.

ALDUS. [See MANUTIUS.]

ALE. The etymology of this word is rather uncertain; the most probable conjecture is, that it is Anglo-Saxon. For specific information respecting the mode of manufacturing ale, and its distinction from beer and porter, we must refer to BREWING, confining this article to a general history of ale as an article of consumption by man. The use of an intoxicating beverage composed of barley or other grain steeped in water and afterwards fermented, may be traced in several parts of the ancient world. Pliny the Naturalist states, that in his time it was in general use amongst all the several nations who inhabited the western part of Europe; and, according to him, it was not confined to those northern countries whose climate did not permit the successful cultivation of the grape. He mentions that the inhabitants of Egypt and Spain used a kind of ale; and says that, though it was differently named in different countries, it was universally the same liquor. See Plin. *Nat. Hist.* lib. xiv. c. 22. Herodotus, who wrote 500 years before Pliny, tells us that the Egyptians used a liquor made of barley (ii. 77.) Dion Cassius alludes to a similar beverage amongst the people inhabiting the shores of the Adriatic, lib. 49, *De Pannoniis*. Tacitus states, that the ancient Germans 'for their drink drew a liquor from barley or other grain, and fermented it so as to make it resemble wine.'—Tacit. *De Mor. Germ.* c. 23. Ale was also the favourite liquor of the Anglo-Saxons and Danes; it is constantly mentioned as one of the constituents of their feasts; and before the introduction of Christianity amongst the northern nations, it was an article of belief amongst them that drinking copious draughts of ale formed one of the chief felicities of their heroes in the Hall of Odin. It is expressly named as one of the liquors provided for a royal banquet in the reign of Edward the Confessor. If the accounts given by Isidorus and Orosius of the method of making ale amongst the ancient Britons and other Celtic nations be correct, it is evident that it did not materially differ from our modern brewing. They state, 'that the grain is steeped in water and made to germinate; it is then dried and ground; after which it is infused in a certain quantity of water, which is afterwards fermented.' (Henry's *History of England*, vol. ii. p. 364.)

In early periods of the history of England, ale and bread appear to have been considered as equally *victuals* or absolute necessaries of life. This appears from the various assizes or ordinances of bread and ale (*assisæ panis et cervisiæ*) which were passed from time to time for the purpose of regulating the price and quality of these articles. In the 51st year of the reign of Henry III. (1266) a statute was passed, the preamble of which alludes to earlier statutes on the same subject, by which a graduated scale was established for the price of ale throughout England. It declared that 'when a quarter of wheat was sold for three shillings, or three shillings and four-pence, and a quarter of barley for twenty pence or twenty-four pence, and a quarter of oats for fifteen pence, brewers in cities could afford to sell two gallons of ale for a penny, and out of cities three gallons for a penny; and when in a town (in burgo) three gallons are sold for a penny, out of a town they may and ought to sell four.' In process of time this uniform scale of price became extremely inconvenient and oppressive; and by the statute 23 Henry VIII. c. 4, it was enacted that ale-brewers should charge for their ale such prices as might appear convenient and sufficient in the discretion of the justices of the peace within whose jurisdiction such ale-brewers should dwell. The price of ale was regulated by provisions like those above stated, and the quality was ascertained by officers of great antiquity, called '*gustatores cervisiæ*,'—ale-tasters, or ale-conners. These officers were regularly chosen every year in the court-leet of each manor, and were sworn 'to examine and assay the beer and ale, and to take care that they were good and wholesome, and sold at proper prices according to the assize; and also to present all defaults of brewers to the next court-leet.' Similar officers were also appointed in boroughs and towns corporate; and in many places, in compliance with charters or ancient custom, ale-tasters are, at the present day, annually chosen and sworn, though the duties of the office are fallen into disuse. These ancient regulations appear to have been dictated by a regard to public health; but in modern times, since ale and beer have become exciseable commodities, the numerous restrictions and provisions which have been introduced are directed principally to the security of the revenue and the convenient collection of duties; though they undoubtedly secure the consumer, to a certain extent, from any adulteration of the article by the admixture of improper ingredients.

ALEHOUSES. The adoption of efficient measures for the regulation of houses appropriated to the sale of intoxicating liquors among the lower orders of the people has been found, especially in populous countries, to be absolutely necessary to the well-being of society. Upon practical subjects, the experience of the past is always the best guide to an opinion for the future; and it may, therefore, be useful to trace, in a summary manner, the history of the laws which have been employed in this country for effecting the due regulation of alehouses. By the common law of England, it was as lawful for a person to open a house for the sale of beer and ale as to keep a shop for the purpose of conveniently selling any other commodity by which he might choose to gain his livelihood; subject only to a criminal prosecution for a nuisance if his house was kept in a disorderly manner, by permitting tippling or excessive drinking, or encouraging bad company to resort thither, to the danger and disturbance of the neighbourhood. As civilization and population increased, this restriction was found to be insufficient; and so early as the eleventh year of the reign of Henry VII. (1494) an act of parliament passed by which two justices of the peace were empowered 'to reject the common selling of ale.' This slight notice of the subject in the statute 2 Henry VII., c. 2, seems to have been entirely disregarded in practice; and by a statute passed in 1552, (5 and 6 Edward VI., c. 25,) reciting, that 'intolerable hurts and troubles to the commonwealth daily grew and increased through such abuses and disorders as were had and used in common alehouses and other houses called tippling-houses,' power was given to magistrates to forbid the selling of beer and ale at such alehouses; and it was enacted that 'none should be suffered to keep alehouses unless they were publicly admitted and allowed at the sessions, or by two justices of the peace; and the justices were directed to take security, by recognizances, from all keepers of alehouses, against the using of unlawful games, and for the maintenance of good order therein; which recognizances were to be certified to the quarter sessions, and there recorded.' Authority is then given to the justices at quarter sessions to inquire whether any acts have been done by alehouse-keepers which may subject them to a forfeiture of their recognizances. It is also provided that 'if any person, not allowed by the justices, should keep a common alehouse, he might be committed to gaol for three days, and, before his deliverance, must enter into a recognizance not to repeat his offence; a certificate of the recognizance and the offence is to be given to the next sessions, where the offender is to be fined 20*s*.' This statute formed the commencement of the licensing system, and was the first act of the legislature which placed alehouses expressly under the control and direction of the local magistrates; and alehouses continued to be regulated by its provisions, without any further interference of the legislature, for upwards of fifty years.

In 1604 a statute was passed (2 Jac. I., c. 9) expressly, as its preamble states, for the purpose of restraining the 'inordinate haunting and tippling in inns, alehouses, and other victualling houses.' This act of parliament recites, that 'the ancient, true, and principal use of such houses was for the lodging of wayfaring people, and for the supply of the wants of such as were not able, by greater quantities, to make their provision of victuals, and not for entertainment and harbouring of lewd and idle people, to spend their money and their time in lewd and drunken manner;' and then enacts 'that any alehouse-keeper suffering the inhabitants of any city, town, or village, in which his alehouse is situated, (excepting persons invited by any traveller as his companion during his abode there; excepting also labourers and handicraftsmen, on working-days, for one hour at dinner time to take their diet, and occasional workmen in cities, by the day, or *by the great*, lodging at such alehouses during the time of their working,) to continue drinking or tippling therein, shall forfeit 10*s*. to the poor of the parish for each offence.' From the exceptions introduced in this statute, and also from the preamble, it is quite clear that, in the time of James I., alehouses were used for a purpose which is now almost wholly discontinued; and that it was then common for country labourers both to eat their meals and to lodge in them. This practice might have arisen from the injudicious prohibition of cottages in the reign of Elizabeth, and the statutes of Inmates, which limited the number of inmates in a house to one family; or it may have been the natural step in the progress of civilization, from the absolute dependence of the servant on his master, both for subsistence and lodging, to the improved condition of the free labourer, who provides himself with necessaries.

The operation of the last-mentioned statute was limited to the end of the next session of parliament, in the course of which a statute (4 Jac. I., c. 4) was passed, imposing a penalty upon persons selling beer or ale to unlicensed alehouse keepers; and by another statute (4 Jac. I., c. 5) of the same parliament, it was enacted that 'every person convicted, upon the view of a magistrate, of remaining drinking or tippling in an alehouse, should pay a penalty of 3*s*. 4*d*. for each offence, and in default of payment be placed in the stocks for four hours.' The latter statute further directs, that 'all offences relating to alehouses shall be diligently presented and inquired of before justices of assize, and justices of the peace, and corporate magistrates; and that all constables, *ale-conners*, [see ALE,] and other officers in their official oaths, shall be charged to present such offences within their respective jurisdictions.' The next legislative notice of alehouses is in the 7th Jac. I., c. 10, which, after reciting that 'notwithstanding former laws, the vice of excessive drinking and drunkenness did more and more abound, enacts, as an additional punishment upon alehouse-keepers offending against former statutes, that, for the space of three years, they should be utterly disabled from keeping an alehouse. The 21st Jac. I., c. 7, declares, that the above-mentioned statutes, having been found by experience to be good and necessary laws, shall, with some additions to the penalties, and other trifling alterations, be put in due execution, and continue for ever. A short statute was passed soon after the accession of Charles I., (1 Car. I., c. 4,) which supplied an accidental omission in the statutes of James; and a second (3 Car. I., c. 3) facilitates the recovery of the 20*s*. penalty imposed by the statute of Edward VI., and provides an additional punishment, by imprisonment, for a second and third offence. At this point all legislative interference for the regulation and restriction of alehouses was suspended for more than a century.

It is remarkable that the circumstances which led to the passing of the above-mentioned statutes in the early part of the reign of James I., and the precise nature of the evils and inconveniences alluded to in such strong language in the preambles, are not described by any contemporaneous writers. It appears, however, from the Journals, that they gave rise to much discussion in both houses of parliament, and were not eventually passed without considerable opposition.

What the extent of the evils arising from alehouses might have been, if these restrictive laws had not been passed, is, of sourse, mere matter of conjecture; but they never appear to have produced the full advantage which it was expected would be derived from them. During the reign of Charles I. the complaints against alehouses were loud and frequent. In the year 1635 we find the Lord Keeper Coventry, in his charge to the judges in the Star Chamber previously to the circuits, inveighing in strong and angry terms against them. (See Howell's *State Trials*, vol. iii. p. 835.) He says, 'I account alehouses and tippling-houses the greatest pests in the kingdom. I give it you in charge to take a course that none be permitted unless they be licensed; and, for the licensed alehouses, let them be but a few, and in fit places; if they be in private corners and ill places, they become the dens of thieves—they are the public stages of drunkenness and disorder; in market towns, or in great places or roads, where travellers come, they are necessary.' He goes on to recommend it to the judges to 'let care be taken in the choice of alehouse-keepers, that it be not appointed to be the livelihood of a great family; one or two is enough to draw drink and serve the people in an alehouse; but if six, eight, ten, or twelve, must be maintained by alehouse keeping, it cannot choose but be an exceeding disorder, and the family, by this means, is unfit for any other good work or employment. In many places they swarm by default of the justices of the peace, that set up too many; but if the justices will not obey your charge herein, certify their default and names, and, I assure you, they shall be discharged. I once did discharge two justices for setting up one alehouse, and shall be glad to do the like again upon the same occasion.' During the Commonwealth, the complaints against alehouses still continued, and were of precisely the same nature as those which are recited in the statutes of James I. At the London sessions, in August, 1654, the court made an order for the regulation of licenses, in which it is stated, that the 'number of alehouses in the city were great and unnecessary, whereby lewd and idle people were harboured, felonies were plotted and contrived, and disorders and disturbances of the public peace promoted.' Amongst several rules directed by the court on this occasion for the removal of the evil, it was ordered that 'no new licenses shall be granted for two years.' During the reign of Charles II. the subject of alehouses was not brought, in any shape, under the consideration of the legislature; and no notice is taken by writers of that period of any peculiar inconveniences sustained from them, though, in 1682, it was ordered by the court, at the London sessions, that no license should in future be granted to alehouse-keepers frequenting conventicles. The next act of parliament on the subject passed in the year 1729, when the statute 2 Geo. II., c. 28, § 11, after reciting that 'inconveniences had arisen in consequence of licenses being granted to alehouse keepers by justices living at a distance, and therefore not truly informed of the occasion or want of alehouses in the neighbourhood, or the characters of those who apply for licenses, enacts that 'no license shall in future be granted but at a general meeting of the magistrates acting in the division in which the applicant dwells.' It should be remarked, that at this period a most pernicious element in the compound of mischief produced by public houses had recently sprung into existence, in the shape of spirituous liquors; and in the statute which we have just mentioned, a clause is contained, placing the keepers of liquor or brandy-shops under the same regulations as to licenses as alehouse-keepers. The eagerness with which spirits were consumed at this period by the lower orders of the people in England, and especially in London and other large towns, appears to have resembled rather the brutal intemperance of a tribe of savages than the habits of a civilized nation. Various evasions of the provisions of the licensing acts were readily suggested to meet this inordinate demand; and in 1733 it became necessary to enforce, by penalty, the discontinuance of the practice of 'hawking spirits about the streets in wheelbarrows, and of exposing them for sale on bulks, sheds, or stalls.' (See 6 Geo. II., c. 11.) From this time alehouses became the shops for spirits, as well as for ale and beer; in consequence of which, their due regulation became a subject of much greater difficulty than formerly; and this difficulty was heavily increased by the growing importance of a large consumption of these articles to the revenue. Besides this, all regulations for the prevention of evils in the management of alehouses were now embarrassed by the arrangements which had become necessary for the facility and certainty of collecting the excise duties.

In 1753 a statute was passed (26 Geo. II., c. 31) by the provisions of which, with some trifling modifications by later statutes, the licensing of alehouses continued to be regulated for the remainder of the last century. This statute, after reciting that 'the laws concerning alehouses, and the licensing thereof, were insufficient for correcting and suppressing the abuses and disorders frequently committed therein, contains, amongst others, the following enactments:—1. That upon granting a license to any person to keep an alehouse, such person should enter into a recognizance in the sum of 10*l.*, with sufficient sureties, for the maintenance of good order therein. 2. That no license should be granted to any person not licensed the preceding year, unless he produced a certificate of good character from the clergyman and the majority of the parish officers, or from three or four respectable and substantial inhabitants, of the place in which such alehouse is to be. 3. That no license should be granted but at a meeting of magistrates, to be held on the 1st of September in every year, or within twenty days afterwards, and should be made for one year only. 4. Authority is given to any magistrate to require an alehouse-keeper, charged upon the information of any person with a breach of his recognizance, to appear at the next quarter sessions, where the fact may be tried by a jury, and in case it is found that the condition of the recognizance has been broken, the recognizance is to be estreated into the Exchequer, and the party is utterly disabled from selling ale or other liquors for three years. By a statute passed in 1808 (48 Geo. III., c. 143) a difference was introduced into the mode of licensing, not with a view to the internal regulation of alehouses, but for purposes connected with the collection of the revenue. The license, which was formerly obtained from the magistrates, was, by that act, to be granted by the commissioners, collectors, or supervisors of excise, under certain specific directions, and upon the production by the applicant of a previous license or allowance, granted by the magistrates, according to the provisions of the former statutes respecting licensing. The next act of parliament upon this subject was passed in 1822, (3 Geo. IV., c. 77,) but as that statute continued in operation for only a few years, it is unnecessary to specify its provisions further than to notice, that the preamble states the insufficiency of the laws previously in force respecting alehouses, and that one of its provisions is considerably to increase the amount of the recognizances required both from the alehouse-keeper and his sureties. In 1828 a general act to regulate the granting of alehouse licenses was passed, (9 Geo. IV., c. 61,) which repeals all former statutes on this subject, and enacts a variety of provisions, of which the following are the most important:—1. Licenses are to be granted annually, at a special session of magistrates, appointed and summoned in a manner particularly directed, and to be called the General Annual Licensing Meeting, to be holden in Middlesex and Surrey, within the first ten days of March, and in every other place between the 20th of August and the 14th of September. 2. Every person intending to apply for a license must affix a notice of his intention, with the name, abode, and calling of the applicant, on the door of the house, and on the door of the church or chapel of the place in which it is situated, on three several Sundays, and must serve a copy of it upon one of the overseers, and one of the peace officers. 3. If a riot or tumult happens, or is expected to happen, two justices may direct any licensed alehouse-keeper to close his house; and if this order be disobeyed, the keeper of the alehouse is to be deemed not to have maintained good order therein. 4. The license is subjected to an express stipulation that the keeper of the house shall not adulterate his liquors; that he shall not use false measures; that he shall not permit drunkenness, gaming, or disorderly conduct in his house; that he shall not suffer persons of notoriously bad character to assemble therein; and that (except for the reception of travellers) he shall not open his house, during divine service, on Sundays and holydays. 5. Heavy and increasing penalties for repeated offences against the tenor of the license are imposed; and magistrates at sessions are empowered to punish an alehouse-keeper, convicted by a jury of a third offence against the tenor of his license, by a fine of 100*l.*, or to adjudge his license to be forfeited.

The last act of parliament which relates to the regulation of alehouses is the late 'act to permit the general sale of beer and cider by retail in England.' (1 Will. IV., c. 64.) The following are the most material provisions of this statute:—1. That any householder, desirous of selling malt liquor and cider, by retail, in any house, may obtain an excise license for that purpose, to be granted by the commissioners of excise in London, and by collectors and supervisors of excise in the country, upon payment of two guineas. 2. That a list of such licenses shall be kept at the Excise Office, which is at all times to be open to the inspection of the magistrates. 3. That the applicant for a license must enter into a bond with a surety for the payment of any penalties imposed for offences against the act. 4. That any person licensed under the act, who shall deal in wine or spirits, shall be liable to a penalty of 20*s.* 5. That in cases of riot, persons so licensed shall close their houses upon the direction of a magistrate. 6. That such persons suffering drunkenness or disorderly conduct in their houses shall be subject to penalties which are to be increased on a repetition of the offences, and the magistrates before whom they are convicted may disqualify them from selling beer for two years. 7. That such houses are not to be open before four in the morning nor after ten in the evening, nor during divine service on Sundays and holydays. The reader will observe that the effect of this statute is to withdraw the authority of granting licenses to houses opened for the sale of ale, beer, and cider, from the local magistrates, in whose hands it had been exclusively vested for nearly 300 years, and to supersede their direct and immediate superintendence and control of such houses. The consequence of the facility of obtaining licenses upon a small pecuniary payment, and without the troublesome and expensive process directed by former statutes, has been a rapid and enormous multiplication of alehouses throughout the country, together with very general complaints, especially in the southern and western districts, and amongst the rural population of a considerable increase of idleness and crime, and of increased and increasing demoralization among the labouring classes of the people. A discussion of the justice of these complaints would be foreign to the purpose of this article, and lead too far into the field of controversy; besides which, the facts are at present not sufficiently ascertained to justify the formation of a positive opinion as to the necessity of a change, or the mode of effecting it. It cannot, however, be too often or too strongly impressed upon the minds of all, that it is a fatal error to consider this question too strictly with a view to finance and revenue; these objects, momentous as they undoubtedly are at this period, ought not to supersede those which are of much more weighty importance, as permanently affecting the moral and intellectual character, as well as the health, comfort, and independence of the lower orders of the community. Even as a matter of finance, the encouragement of the use of intoxicating liquors has been considered, by very competent judges, as an object of doubtful policy. 'For government to offer encouragement to alehouses,' says Sir Frederic Morton Eden, in his valuable History of the Poor, 'any further than they are wanted for the many useful purposes which they serve among the labouring classes, is to act the part of a *felo de se*. Nor ought the public ever to be lulled into an acquiescence by the flattering bait of immediate gain, which ere long they would be obliged to pay back to paupers, in relief, with a heavy interest.'

ALEMAN (MATEO). This celebrated Spanish writer was born at Seville about the middle of the sixteenth century. He held an important office in the financial department, under Philip II., which he filled with honour for a long period. Disgusted at last with the broils of the court, he requested his dismissal; and having obtained it, he retired to devote himself entirely to study. In 1604 he published the *Life of St. Antonio de Padua* with an *Encomiasticon in eundem*, in Latin verses, not without merit. We are ignorant of the motive or object of his voyage to Mexico, and only know that in 1609 he published there an *Ortografia Castellana*. But the work which entitles him to the notice of posterity is his *Guzman de Alfarache*, which he published at Madrid in 1599. In this amusing and interesting work Aleman shows he was both a philosopher and a man of the world. It is a bitter satire on the corrupted manners of Spain at that period. The enterprising genius of Charles V. had inspired the Spanish youth with an ambition for military glory, and drawn them off from the cultivation of the useful arts and sciences. His successors were incapable of preserving the immense empire raised by him, and the huge edifice began to fall already under his son. The nation was then swarming with a multitude of men, who, thinking it degrading to earn an honest livelihood, did not scruple to live by cheating and swindling. This was the origin of the multitude of those novels called *Picarescas*, which, from the beginning of the sixteenth to the latter end of the seventeenth centuries, appeared in Spain, intended to describe the life and manners of rogues, vagabonds, and beggars, bringing also the other classes of society upon the stage, either as their victims, abettors, or protectors. Such is the character of Aleman's work. It is written in a pure and correct style, though, from the nature of the subject, it is very often vulgar and even indelicate. The abruptness and rapidity with which the author passes from one subject to another, together with the use of low slang words, render it obscure in many passages. His practice of moralizing or rather preaching is very often carried too far; but we must not forget the age and country in which the author lived. His book was soon translated into almost all the European languages. A French translation appeared in 1600 by Chapui. James Mabbe of Magdalene College, Oxford, translated *Guzman de Alfarache* into English, the first edition of which was published 1622 or 23, the 2d in 1630, and the 3d in 1634. The work of Le Sage, which bears the title of *Guzman de Alfarache*, resembles in no respect the novel of Aleman. In this work as in his other productions, Le Sage copied indeed the figures, but he made out of them a picture adapted to the taste of the French public. We are not acquainted with the precise time of Aleman's death, but it is supposed that it occurred under the reign of Philip III. Nicolao Antonio, *Bibliotheca Hispana Nova.*

ALEMANNI, or ALLEMANNI. It is difficult to give a clear and satisfactory account of this people, although many notices concerning them are to be found in the works both of Greek and Roman authors. These notices, however, generally detail only the circumstances of particular invasions and of mutual injuries, committed on the Roman frontier; but a comprehensive view of the history, and an accurate information respecting the origin and internal government of the Alemanni, are nowhere to be obtained. Their very name, Alemanni, *Allemanni*, *Alamanni*, or *Allamanni*, (the Greek writers call them Αλαμβαννοι,) has been the subject of much fruitless speculation; and after all that critics, etymologists, antiquaries, and historians have said about it, that derivation of this name which was the most obvious, and which perhaps found less favour because it was so, still seems more probable than any other. It surely is more natural to look for the origin of the word *Alemanni* in some Teutonic dialect, ancient or modern, than anywhere else; for it cannot be doubted that this people were Germans.

Ancient authors agree in this, that the Alemanni were a mixed race, and this word a generic name for many tribes. Agathias, in b. i. c. 6. of his *History*, has the following remarkable passage:—'If we are to follow Asinius Quadratus, an Italian, who has written an accurate account of the *Germans*, the Allemanni were a *gathered mob* and *mixed race*, (ξύγκλυδες ἄνθρωποι καὶ μιγάδες,) and this *is expressed by their very name.*' Thus we may, without great reluctance, admit, that the Roman word *Allemanni* was formed from the Alemannic *Allemannen*, since we find that, in German, ALLE still signifies *all*, and MANN (*plur.* männer), *a man*, and that *Allemannen* meant in their language *all men*, or *all sorts of men*,—a vast union of many tribes. Icelandic analogy supports this etymology. In the ancient Norse (*i. e.* Icelandic), the Germans are called PIODVERJAR, i. e. *the men of the nation*, from *Piód*, a nation, and *ver*, *verji*, a man, a defender, protector. The Germans, then, in the eyes of their northern neighbours, were the nation of nations—the great nation—*the nation* κατ᾽ ἐξοχὴν—and thus Romans and Scandinavians used a term, in different languages indeed, yet conveying the same idea, as a name for this people. The French, too, as they have borrowed from the Normans the name of *Normand*, which was significant in the language of the latter though not in French, so they have also borrowed from the Alemanni the appellation *Allemand*, which they have extended to the whole German nation,—also significant in the German, but not in French.

It is likely that the sound of the word Alemanni recommended it to the Romans; considering that it was barbarous, still it was sonorous, and the surname of Alemannicus, which Caracalla is said to have adopted, was easily formed from it, and probably pleased the matrons of Rome. At all events it is more natural thus to derive the name of *Alemanni* from native Germanic roots, than, as several learned etymologists and critics have done, from the *Welch* word *Ellmyn*, being an irregular plural of the sing. *Alltud*, which signifies a foreigner. We say *Welch word* advisedly, not Celtic word, as Rickless, for example, does; for although the Welch is one of the Celtic languages, it is not the pure, or the parent Celtic, but one of the more mixed of the languages of that family; and even if *Ellmyn* were pure and ancient Celtic, little would be gained: the Celtic nations had, at the time when the Allemanni are mentioned by the Romans, been long settled in the westernmost parts of Europe; and it would be difficult, at that period, to prove their presence in any part of Germany.

Moreover, it would be a singular nation, who styled themselves *the Foreigners*, as the Alemanni must have done if the derivation of their name from Ellmyn be true; for it is most natural to suppose, that the Romans learned their name from the Alemanni themselves: and lastly, it follows that these people must have adopted the national designation of *Foreigners* from a language which was foreign to them. It would not mend matters much to suppose, that the Romans learned the name of Alemanni from the Gauls, for that supposition again involves many other improbable suppositions. Pfister's derivation in the *Allgemeine Encyclopædie*, art. Allemanni, is equally fanciful and uncritical, which we think proper, although foreign to the general plan of this work, to notice, it being a not unessential part of truth to confute error, when supported by respectable, and therefore more misleading, authority. On the other hand, the derivation of Alemanni in the most natural way from *Alle männer*, is recommended by the very common practice with many nations, to adorn themselves with boastful names, or with such as harmonize with their distinctive habits or lofty pretensions.

The boundaries of the territory of the Alemanni are even more uncertain than their name; for they seem to have varied much at different periods. Their principal abode, the nucleus from which their dominions spread, was the very heart of Germany, the space between the sources of the Rhine and the Danube; from this vital centre, their sway seems to have extended very far along the banks of both these rivers, towards N.E. and N.W. occupying the entire space between them. In the earliest period of their history, their limits are supposed to have been the Rhine, the Danube, and the Maine; in subsequent ages their territory extended towards the Alps and the Jura mountains. The first notice respecting them in history occurs in the year 214, in the reign of Caracalla. This emperor sojourned some time among them, and lived with them on good terms, as they greatly admired his hardiness, frugality, military habits, and personal bravery, as well as his plainness and affability of manner, for he affected entirely to forget the emperor, and assumed the part of their companion. But this play, like every other performance, had its end. Under pretext of raising a regiment of auxiliaries, he called a meeting of those among them who were of military age, and having surrounded them by his soldiers, he gave a signal for a general massacre; such as fled were hunted down by the cavalry. This vile treachery kindled an inextinguishable hatred to the Romans in the breast of the Alemanni; and through many succeeding centuries they continued the most unrelenting enemies of the empire. They also had their revenge on Caracalla. In a battle which they fought with him, their fury is said to have been such, that they drew out with their teeth the arrows by which the Osroeni, who were allies of the Romans, wounded them, lest time should be lost by making use of their hands, which they thought better employed in cutting the Romans down without intermission. They suffered, however, Caracalla to buy of them the *name of victory* for a great sum of money, which he took care to pay in pure gold, at a time when he only used base coin at home. Those of the wives of the Alemanni whom the Romans took captive, put themselves, and many of them their children also, to death, in order to save them from slavery.

After Caracalla's departure, they became much more powerful on the Rhine, for after this period we find them making frequent incursions into Gaul. Alexander Severus at length led an army against them, but being murdered by his own soldiers, he left the victory to his successor Maximinus, who overran and devastated their country from the Rhine to the Danube. During the disturbances in the Roman empire in 237 and the following years, caused by the despotism and bad conduct of Maximus, the Alemanni recommenced their invasions in Gaul with impunity. In the years 257-60, Valerian's general, Posthumus, again drove them out of that country and erected fortresses in their territory. These they indeed repeatedly demolished, but the Romans always repaired them, and held them in possession till the reign of the Emperor Probus (282). After his death the Alemanni could no longer be resisted. Dioclesian in 285, and Maximian in 287, seem only to have attempted to defend the Roman possessions to the west of the Rhine; and although the latter slaughtered vast numbers of them, he gained no further advantage than that the Rhine remained the common boundary. Constantinus Chlorus, in 298-301, again ventured to cross the Rhine, and even marched as far as to the Danube; still the Romans gained no permanent possession of the countries to the east of the Rhine. In a bloody battle at Langres, Constantine the Great slew vast numbers of them, and after this disaster they remained quiet till the year 337; but during the reign of the sons of Constantin they again invaded Gaul, and made their settlements on both banks of the Rhine co-extensive, *i.e.* from the Maine to the other side of Strasburg. Julian, in 356-361, not only drove them out of Gaul, but even made several expeditions into their German domains. In 357 he beat seven of their chieftains in a bloody battle at Strasburg, at which time Chonodomar was their commander-in-chief. The third time, in 359, he seems to have attacked them almost without a cause. The words of Ammianus Marcellinus are as follows: 'He reflected that some of their gaues (pagi) were hostile, and that they would commit outrages unless they were put down like the rest.' For this expedition Julian made great preparations, by sending Hariobandus, a distinguished officer, as a spy, before him, by strengthening his alliance with those Alemannic kings with whom he was at peace, by fortifying the frontier towns nearest the enemy, collecting provisions, and building granaries: yet, when he arrived on the banks of the Rhine near Maynz, he found them well prepared. They defended their frontiers with great spirit, and during a considerable time the Roman emperor found it impossible to cross the river, as they watched his movements from the opposite bank; and wherever he attempted to throw a bridge, they were present on the spot and ready to give him a reception, which rendered the attempt unadvisable. The emperor at last had recourse to stratagem, and made a number of soldiers in small boats cross the river during the night, yet they effected nothing of consequence. Finally, however, assisted by the treachery of an Alemannic chief, Julian crossed, and in this expedition he penetrated even to their eastern boundary. Eight Alemannic chiefs, or dukes, Hortensius, Suomarius, Macrianus, Hariobaudus, Urius, Urficinus, Vestralphus, and Vadomarius, concluded a peace with Julian at Maynz. During the latter part of his reign, they did not venture to attack the Romans; but Valentinian I. had almost incessantly to contend with them in his own domain. Gratian, in 377, fought with them a bloody battle at Argusturia (now Horburg). In the latter part of the fourth and the beginning of the fifth centuries, they occupied the southern and western banks of the Rhine, opposite the mouths of the Neckar and Main, almost without evacuating their former abodes. In the middle of the fifth century, they spread over Helvetia, as far as to the Jura and the Lake of Geneva. In whatsoever region they settled, they preserved their national language and manners. After the bloody victory gained by the Frankish king Clodwig, at Tolbiacum (now Zülpich), in 496, they lost their eastern and western Frankish possessions. Many of them, disdaining to dwell in a subdued country, sought refuge with Theodric the Great, who assigned to them abodes in Rhætia. In 536, Vitiges ceded them to the Franks; and after this they were united to the Suevi, and with them consolidated into a dukedom, called the *Duchy of Alemannia*. Subsequent to this period, their history becomes more and more confused, and is also absorbed in the general history of Germany; yet from that circumstance, and from the extension which the French have given to their name, we may judge that they were a leading, a preponderating tribe among the Germanic nations.

As branches of the Alemanni, there have been mentioned the Cenni (*Κέννοι*), the Leutienses, the Juthungi, the Vithungi, and the Buzinobantes, on the right bank of the Main. The first of these Dion Cassius calls a Celtic nation (Κελτικὸν ἔθνος); but it is difficult to conceive that this statement should be free from error, or, if they were Celts, to admit the theory of modern authors, who make them a branch of the Alemanni.

The Alemanni were a very warlike people, and the Romans particularly admired their cavalry, probably because, like the Gothic and Teutonic nations in general, they were equally fit for equestrian and infantry service. The country was divided into *gauen* (pron. *Gow-en*), by the Romans called *pagi;* which had their name either from the tribes who inhabited them, or from the chiefs or dukes, called kings by the Romans, who ruled over them. Each of these had its peculiar constitution, and was independent: in war only they all acted as one people, with united interests, and had one general. The Alemanni had a peculiar body of laws given to them by the kings Theodric, Childebert, and Clothar, and improved by Dagobert.

For the Alemannic language, see *Germanic Languages*, and the art. TEUTONIC. Notices respecting the Alemanni are to be found in Herodian, Dion Cassius, Ammianus Marcellinus, Agathias, and Aurelius Victor.

ALEMBERT (JEAN LE ROND D'). The birth of this eminent man is stated by some to have taken place on the 16th, by others on the 17th, of November, 1717. This matter is of the less consequence, as his career ought rather to be dated from his abandonment by his parents and exposure in a public market by the church of St. Jean le Rond, near the cathedral of Notre Dame, at Paris, from which he derived his christian name. How he obtained his surname is not mentioned: probably it was that of his foster-mother. He was found by a commissary of police, and instead of being conveyed to the hospital of *Enfans Trouvés*, was intrusted to the wife of a poor glazier, on account of the care which his apparently dying state required. It has been supposed that the discovery, as well as the exposure, was arranged beforehand, as in a few days the father made himself known, and settled an allowance of twelve hundred francs a year, or about fifty pounds sterling, for his support. Other accounts state that the abandonment was the act of the mother, and that the father, upon hearing it, came forward for the protection of his son. This father was M. Destouches, commissary of artillery; the mother was Madame, or more properly, Mademoiselle de Tencin, a lady celebrated for her talents and adventures, and authoress of several works, in one of which, *Les Malheurs de l'Amour*, she is supposed to have given a sketch of her own life. She was sister of Peter Guerin de Tencin, Cardinal Archbishop of Lyons, and took the veil in the convent of Montfleuri, near Grenoble, which place she afterwards quitted, and settled at Paris, where she became more celebrated for wit than virtue. It is said that when D'Alembert began to exhibit proofs of extraordinary talent, she sent for him, and acquainted him with the relationship which existed between them; and that his reply was, 'You are only my step-mother—the glazier's wife is my mother.'

D'Alembert commenced his studies at the *Collége des Quatre Nations*, at the age of twelve years. The professors were of the Jansenist party, and were not long in discovering the talents of their pupil. In the first year of his course of philosophy, he wrote a commentary on the Epistle to the Romans, from which, as Condorcet remarks, they imagined they had found a new Pascal; and, to make the resemblance more complete, turned his attention to mathematics. The attempted parallel probably never existed except in the ingenious head of the author of the *Eloge;* for D'Alembert himself informs us, that his professors did their best to dissuade him both from mathematics and poetry, alleging that the former, in particular, *dried up the heart*, and recommending, as to the latter, that he should confine himself to the poem of St. Prosper upon Grace. They permitted him, nevertheless, to study the rudiments of mathematics, and from that time he persisted in the pursuit. When he left college, he returned to his foster-mother, with whom he lived altogether forty years, and continued his studies. Not that she gave him much encouragement, for when he told her of any work he had written, or discovery which he had made, she generally replied, '*Vous ne serez jamais qu'un philosophe; et qu'est ce qu'un philosophe? c'est un fou qui se tourmente pendant sa vie, pour qu'on parle de lui lorsqu'il n'y sera plus;*' which we may English thus, 'You will never be anything but a philosopher—and what is that but an ass who plagues himself all his life, that he may be talked about after he is dead.'

With nothing but his income of 1200 francs, and the resource of the public libraries for obtaining those books which he could not buy, he gave up all hopes of wealth or civil honours, that he might devote himself entirely to his favourite studies. Here he was dispirited by finding that he had been anticipated in most of what he imagined to have been his own discoveries. In the mean while his friends urged him to enter a profession, to which he at last agreed, and chose the law. After being admitted an advocate, he abandoned this profession and took to physic, as more congenial to his own pursuits. Determined to persevere, he sent all his mathematical books to a friend, resolved that the latter should keep them till he was made doctor; but he soon found that he could not send his mathematical genius with them. One book after another was begged back, to refresh his memory upon something which he found he could not keep out of his head. At last, finding his taste too strong for any prudential consideration, he gave up the contest, and resolved to devote himself entirely to that which he liked best. The happiness of his life, when he had made this resolution, is thus described by himself. He says that he awoke every morning, thinking with pleasure on the studies of the preceding evening, and on the prospect of continuing them during the day. When his thoughts were called off for a moment, they turned to the satisfaction he should have at the play in the evening; and between the acts of the piece he meditated on the pleasures of the next morning's study.

Some memoirs which he wrote in the years 1739 and 1740, as well as some corrections which he made in the *Analyse démontrée* of Reynau, a work then much esteemed in France, procured him admission to the Academy of Sciences, in 1741, at the age of twenty-four. From this time may be dated the career of honour which ranks him among the greatest benefactors to science of the last century. We will now interrupt the order of his life to specify his principal works. In 1743 appeared his *Treatise of Dynamics*, founded upon the general principle which bears his name. (See PRINCIPLE, D'ALEMBERT'S.) The deductions from this new and fertile source of analytical discovery appeared in rapid succession. In 1744 he published his *Treatise on the Equilibrium and Motion of Fluids*. In 1746 his *Reflections on the General Causes of Winds* obtained the prize of the Academy of Berlin. This treatise will always be remarkable, as the first which contained the general equations of the motion of fluids, as well as the first announcement and use of the calculus of partial differences. In 1747 he gave the first *analytical* solution of the problem of vibrating chords, and the motion of a column of air; in 1749 he did the same for the precession of the equinoxes and the nutation of the earth's axis, the latter of which had been just discovered by Bradley. In 1752 he published his *Essay on the Resistance of Fluids*, a treatise originally written in competition for a prize proposed by the Academy of Berlin, but the decision of which was postponed, and finally awarded to a production which has not since gained any reputation for its author. A misunderstanding between Euler and D'Alembert is asserted by some French writers as the ground of this rejection, which, resting on the well-known character of Euler, we must be permitted to doubt. In the same year he also edited Rameau's *Elements of Music*, though his opinions did not entirely coincide with that celebrated system. In 1747 he presented to the Academy of Sciences his *Essay on the Problem of Three Bodies*, and in 1754 and 1756 he published *Researches on Various Points connected with the System of the Universe.* We must complete the list of his mathematical works by mentioning his *Opuscules*, collected and published towards the end of his life, in eight volumes. Though D'Alembert wrote no large system of pure analysis, the various methods and hints which are so richly scattered in his physico-mathematical works have always been considered as rendering them a mine of instruction for mathematicians.

We now turn to his philosophical productions. The French *Encyclopædia*, as is well known, was commenced by Diderot and himself, as editors; and it is needless to speak of his celebrated Introductory Discourse, a work which, as Condorcet expresses it, there are only two or three men in a century capable of writing. D'Alembert contributed several literary articles; but on the stoppage of the work by the government, after the completion of the second volume, he retired from the editorship, nor would he resume his functions when permission to proceed was at length obtained. From that time he confined himself entirely to the mathematical part of the work, and his expositions of the metaphysical difficulties of abstract science are among the clearest and best on record. While engaged on this undertaking, he wrote his *Mélanges de Philosophie*, &c., *Memoirs of Christina of Sweden*, *Essay on the Servility of Men of Letters to the Great*, *Elements of Philosophy*, and a treatise on *The Destruction of the Jesuits.* He also published translations of several parts of Tacitus, which are admitted by scholars to possess no small degree of merit. In 1772, when elected perpetual secretary of the Academy, he wrote the *Eloges* of the members who had died from 1700 up to that date. His correspondence, and some additional pieces, were published after his death. The whole of his works have been collected in one edition by M. Bastien, in eighteen volumes, octavo, Paris, 1805.

In 1752 Frederic of Prussia, who had conceived the highest esteem for his writings, endeavoured to attract him to Berlin. D'Alembert refused the offer, but in 1754 he accepted a pension of 1200 francs. In 1756, through the friendship of M. d'Argenson, then minister, he obtained the same from Louis XV. In 1755, by the recommendation of Benedict XIV., he was admitted into the Institute of Bologna. In 1762 Catharine of Russia requested him to undertake the education of her son, with an income of 100,000 francs. On his declining the offer, she wrote again to press him, and says in her letter, 'I know that your refusal arises from your desire to cultivate your studies and your friendships in quiet. But this is of no consequence: bring all your friends with you, and I promise you that both you and they shall have every accommodation in my power.' D'Alembert was too much attached to his situation and his income of 150l. a year to accept even this princely offer. The letter of Catharine it was unanimously agreed to enter on the records of the Academy of Sciences. In 1759 Frederic again pressed his coming to Berlin, in a letter in which he says, 'I wait in silence the moment when the ingratitude of your own country will oblige you to fly to a land where you are already naturalized in the minds of all who think.' In 1763, when D'Alembert visited Frederic, the latter again repeated his offer, which was again declined; the king assuring him that it was the only false calculation he had ever made in his life

We now come to relate the history of a connexion which ended by embittering the last years of the life of D'Alembert, and finally, it is supposed, had no small share in sending him to his grave. At the house of a common friend he was in the habit of meeting Mlle. de l'Espinasse, a young lady whose talents caused her society to be sought by the *élite* of the literary world of Paris. Between her and D'Alembert a mutual attachment grew up, which though, as appeared afterwards, not very strong on her part, became the moving passion of his future life. When, in 1765, he was attacked by a violent disorder, she insisted on being his attendant, and after his recovery they lived in the same house. It is said that friendship was their only bond of union; and this may be believed, since, in the then state of opinion, the assertion, if untrue, would have been unnecessary. The friendship, or love, of the lady, however, found other objects; and though D'Alembert still retained all his former affection for her, she treated him with contempt and unkindness. Her death left him inconsolable; and his reflections upon her tomb, published in his posthumous work, present the singular spectacle of a lover mourning for a mistress whose regard for him, as he was obliged to admit to himself, had entirely ceased before her death. After that event, he fell into a profound melancholy, nor did he ever recover his former vivacity. His death took place October 29, 1783. Not having received extreme unction, it was with great difficulty that a priest could be found to inter him, and then only on condition that the funeral should be private.

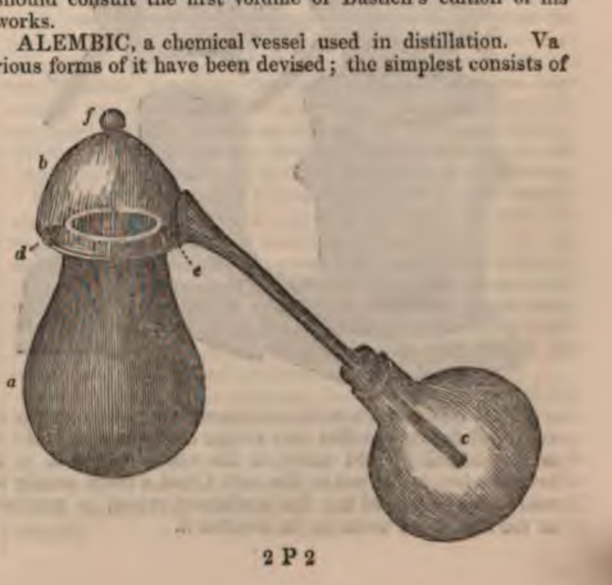
The character of D'Alembert was one of great simplicity, carried even to bluntness of speech, and of unusual benevolence, mixed with a keen sense of the ridiculous, which exerted itself openly and without scruple upon those who attempted the common species of flattery. He was the friend of Frederic of Prussia, because that monarch exacted no servility; and to him only, and two *disgraced* ministers, of all the great ones of the earth, did D'Alembert ever dedicate a work. He was totally free from envy. Lagrange and Laplace owed some of their first steps in life to him; though the former had settled a mathematical controversy in favour of Euler and against him. In his dispute with Clairaut on the method of finding the orbit of a comet, and with Rousseau on the article *Calvin* in the *Encyclopédie*, he gave his friends no reason to blush for his want of temper. It was his maxim, that a man should be *very* careful in his writings, careful *enough* in his actions, and *moderately* careful in his words; his observance of the last part of the maxim sometimes made him enemies. The Duc de Choiseul, when minister, refused the united solicitations in his favour of the Academy of Sciences for a pension vacant by the death of Clairaut, for more than six months, because he had said, in a letter to Voltaire which was opened at the post-office, 'Your protector, or rather your *protégé*, M. de Choiseul.' He cared nothing for those in power, at a time when the latter exacted and obtained deference in very small matters. Madame de Pompadour, who hated all the friends of Frederic, refused the request of Marmontel that she would employ her influence with the king in favour of D'Alembert on one occasion, alleging that the latter had put himself at the head of the Italian party in music. It was his maxim that no man ought to spend money in superfluities while others were in want; and a friend, who knew him well, declared to the editor of his works, that when his income amounted to 8200 francs, he gave away the half. His attentions to his foster-mother, to the end of her life, were those of a son. In his account of his own character, a singular mixture of vanity and candour, written in the third person, he speaks as follows: 'Devoted to study and privacy till the age of twenty-five, he entered late into the world, and was never much pleased with it. He could never bend himself to learn its usages and language, and, perhaps, even indulged a sort of petty vanity in despising them. He is never rude, because he is neither brutal nor severe; but he is sometimes blunt, through inattention or ignorance. Compliments embarrass him, because he never can find a suitable answer immediately; when he says flattering things, it is always because he thinks them. The basis of his character is frankness and truth, often rather blunt, but never disgusting. He is impatient and angry, even to violence, when any thing goes wrong, but it all evaporates in words. He is soon satisfied and easily governed, provided he does not see what you are at; for his love of independence amounts to fanaticism, so that he often denies himself things which would be agreeable to him, because he is afraid they would put him under some restraint; which makes some of his friends call him, justly enough, *the slave of his liberty*.' This account agrees very well with that of his friends.

D'Alembert has been held up to reprobation in this country on account of his religious opinions. But on this point we must observe, that there is a wide line of distinction between him and some of his colleagues in the *Encyclopædia*, such as Diderot and Voltaire. When we blame the two latter, it is, not for the opinions they held, (for which they are not answerable to any man,) but for their offensive manner of expressing them, and the odious intolerance of all opinions except their own which runs through their writings. Men of the best and of the worst lives appeared to be equally offensive to them, if they professed Christianity. The published writings of D'Alembert contain no expressions offensive to religion: they have never been forbidden on that account, as La Harpe observes, in any country of Europe. Had it not been for his private correspondence with Voltaire and others, which was published after his death, the world would not have known, except by implication, what the opinions of D'Alembert were. On this point we will cite two respectable Catholic authorities. The Bishop of Limoges said, during the life of D'Alembert, 'I do not know him personally; but I have always heard that his manners are simple, and his conduct without a stain. As to his works, I read them over and over again, and I find nothing there except plenty of talent, great information, and a good system of morals. If his opinions are not as sound as his writings, he is to be pitied, but no one has a right to interrogate his conscience.' La Harpe says of him, 'I do not think that he ever printed a sentence which marks either hatred or contempt of religion; but we may cite a great many passages where, apparently drawn into enthusiasm by the heroes of Christianity, he speaks of them with dignity, and, *what in him is even more strange*, with sentiment.'—'I knew D'Alembert well enough to be able to say, that he was sceptical in every thing except mathematics. He would no more have said positively that there was *no* religion than that there *was* a God: he only thought the probabilities were in favour of theism, and against revelation. On this subject he tolerated all opinions, and this disposition made him think the intolerant arrogance of the atheists odious and unbearable.'—'He has praised Massillon, Fénélon, Bossuet, Fléchier, and Fleury, not only as writers, but as priests. He was just enough to be struck with the constant and admirable connexion which existed between their faith and their practice, between their priestly character and their virtues.' To these testimonies we need add nothing, except to desire the reader to turn to the part of the letter of the Empress Catherine which we have quoted, and then to recollect that it was the same Empress Catherine who refused a visit from Voltaire, saying, 'that she had no Parnassus in her dominions for those who spoke disrespectfully of religion.'

The style of D'Alembert as a writer is agreeable, but he is not placed by the French in the first rank. His mathematical works show that he wrote as he thought, without taking much trouble to finish. His expression was, 'Let us find out the thing—there will be plenty of people to put it into shape,' an assertion abundantly verified since his time. He said of himself, that he had 'some talent, and great facility.' He liked the mathematical part of natural philosophy better than any other, and took but little interest in purely experimental researches. Hence he remained in ignorance of some of the most striking facts discovered in his day; and when laughed at on the subject, he always said, 'I shall have plenty of time to learn all these pretty things.' The time, however, as Bossuet remarks, never arrived.

Those readers who would know more of D'Alembert should consult the first volume of Bastien's edition of his works.

ALEMBIC, a chemical vessel used in distillation. Various forms of it have been devised; the simplest consists of



a *body*, *cucurbit* or *matrass*, *a*, which serves as a boiler; a *head* or *capital*, *b*, with a pipe and a receiver *c*.

Sometimes all these parts are made of glass, and the head and receiver are usually so: when the body is of this material, it is fitted to the head by grinding; but the apparatus, in this case, is extremely expensive, and very liable to accident. When the body is made of metal, the glass head is secured to it by almond or linseed meal lute.

The fluid to be distilled having been put into the body *a*, the head *b* being fitted to it, and the receiver adapted to its pipe, heat is applied to the body either by a lamp or a sand-bath; the vapour which rises is condensed in the head, and, falling into its depressed channel *e*, runs through the pipe into the receiver *c*, loosely fitted to it with a cork. If the receiver be kept partly immersed in cold water, the condensation will be more readily and economically effected. Sometimes the head is perforated at *f*, and furnished with a stopper; by removing this, a supply of the fluid to be distilled may be poured into the body, without disturbing the luting by which the body and head are kept in close contact. An alembic of this kind is not very useful for the general purposes of distillation: it can scarcely be applied to the preparation of acids; and for distilling spirit or water a retort or a still is much to be preferred. An alembic of this form, the body of which is made of silver, and the head and receiver of glass, is sometimes employed for distilling the spirit from the alcoholic solutions of potash and soda, in the process of purifying these alkalis.

The most ancient alembics were made of metal, and generally of tinned copper; the annexed figures represent that proposed by Baumé in his Elements of Pharmacy, with very slight alteration. It is composed of several parts: *a*, fig. 1, represents the *cucurbit*, *body*, or *boiler*, which is made of tinned copper; *b* is a short pipe by which the boiler is replenished with the fluid to be distilled, during the operation, and without disturbing or unluting the apparatus. When in operation, the pipe *b* is stopped with a cork.

Fig. 2 is a section of the *head* or *capital*, which fits into *a*, and is secured by lute; it is divided into two parts which do not communicate with each other; *c* contains cold water, which, by cooling the vapour that rises from the boiler *a* into *d*, causes it to condense into a fluid, which runs down into a small gutter, and is by it conveyed through the pipe *e* into a receiver; *f* is a *cock* by which the water is let out from *c* when it becomes hot by condensing the vapour.

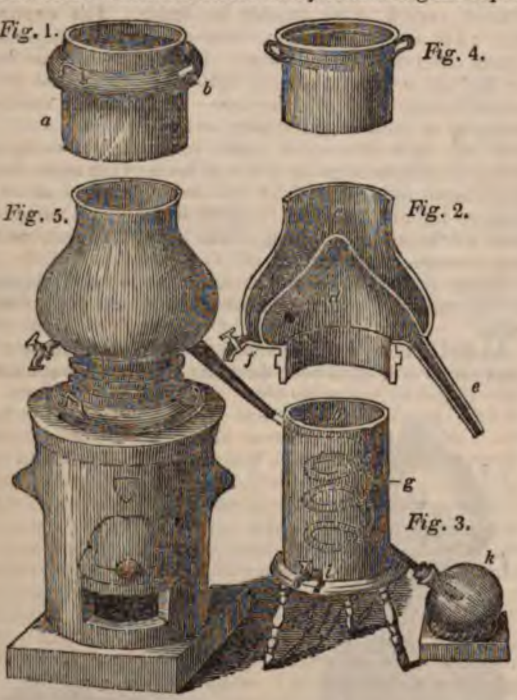


Fig. 3 represents a *worm* or *serpentine*, *g*, into which is conveyed the vapour that may escape condensation in *d*; it is surrounded by cold water in the vessel *h*, which, as it becomes hot, is let out at the *cock* *i*, and a fresh supply of cold water is poured in; the condensed vapour is received at the end of the worm in the receiver *k*.

Fig. 4 represents a *water-bath*, also made of tinned copper; it fits into the body *a*, and is heated by the medium of the boiling-water contained in it, instead of the fire directly applied. When the water-bath is used, the head, fig. 2, is fitted into it in the manner already described with respect to the body *a*, fig. 1.

Fig. 5 shows the whole apparatus placed in the furnace, with the worm attached to the pipe of the head.

The alembic, in the form now described, is but little used; the addition of the worm surrounded with cold water has rendered it unnecessary to employ any refrigeratory round the head; and the apparatus thus simplified is the common still, which will be described under the article DISTILLATION.

ALENÇON, the capital of the department of the Orne, in France, stands in an extensive plain, on the north-west bank of the Sarthe, which here forms the boundary between the departments of the Orne and the Sarthe. The town itself is not very large; but its five suburbs, one of which stands on the opposite bank of the Sarthe, add to its population and importance. The streets are generally broad, and ornamented with some handsome buildings, especially the prefect's residence, the corn-market, and the town house, the towers of which last are the remains of the castle of the Dukes of Alençon. These nobles appear conspicuous in the history of France; one of them fell at the battle of Agincourt, [See AGINCOURT,] while attacking the English king.

The population of Alençon (including, we presume, the suburbs) is given by Malte Brun and Balbi at 14,000; the trade of the place is very considerable. Its chief manufactures are of lace and muslin, the latter of which gives employment to more than two thousand persons, who are engaged in making or embroidering it. Some cottons and linens are also manufactured, as well as leather, glass, and iron. The agricultural products of the neighbourhood, including cattle, horses of good quality, goose down and quills, and cider, add to its commerce. The lace manufacture, which has acquired considerable celebrity, was established by letters patent during the administration of Colbert, in 1665. The proprietor had a monopoly for ten years, and a grant of 36,000 livres, or about 1500*l*.

There are at Alençon a library of above 6000 volumes, an agricultural society, a museum of natural history, and a college; the last-mentioned is surmounted by a lantern, which is used as an observatory. There is also a theatre; and horse-races take place annually, on the 25th of August.

Many religious houses and hospitals, and a Jesuits' college, existed in the town before the revolution. In former ages it was fortified, though the outworks and the greater part of the wall are now destroyed, and little remains of its once formidable defences but four gates, by which you enter the town. It was the birth-place of the historian Mezeray. Alençon is in 48° 26′ N. lat., 5′ E. long. of Greenwich. Distance from Paris 116 miles W. by S.

The neighbourhood of the town produces iron, and stone suited for building or for mill-stones. In the quarry of Hertre, a very few miles distant, were found the false diamonds, called the diamonds of Alençon, said to equal the real stone in brilliancy though not in hardness. The mine is said to be now nearly exhausted.

The arrondissement of Alençon contains 416 square miles, and above 70,000 inhabitants.

ALENTEJO, or **ALEMTEJO**, the largest province of the kingdom of Portugal, so called from its position (*alem Tejo*, beyond the Tagus). It is separated on the east from Spanish Estremadura and Andalusia. The boundary on this side is determined, to begin from the north, first by the river Sever, running into the Tagus, soon after by the Gevora and the Caya, tributaries of the Guadiana, the line crossing from the one to the other stream so as to avoid the proximity of Badajoz. It then follows the Guadiana, leaving Olivenza on the east, which since 1801 has belonged to the Spanish crown. North of Mourão it bends from the river to the S.E. so as to meet first the Ardila, and then the Chanza, the latter of which again conducts it to the Guadiana. From this point the boundary runs west to the ocean, so as to separate Alentejo on the south from the Algarve by the ridges of Caldeirão and Monchique. On the west it is bounded by the *comarca* of Setubal, belonging to Estremadura, and below that by the ocean. The Tagus partly forms its boundary on the north, but in the centre of the line the Portuguese province of Estremadura again extends south of the river. In this part the two provinces are divided by small streams called the *Soro*, *Erra*, and *Zatas*, the two former of which run into the third, the Zatas itself falling directly into the Tagus. The province covers a surface of 883 square leagues, or 7947 geographical square miles, and its population is given by Antillon and Miñano at 380,480, that is 48 to the square mile, while the province of Entre Douro e Minho has a population of 346 to the same surface. Some accounts state the population at only 266,009 in the year 1820. The most fertile parts are around Evora, Portalegre, Elvas, Villaviciosa, Beja, and the plains of Ourique. The highest ridge of mountains is the already-mentioned Sierra de Monchique on the south, which rises at one point to the height of 4078 feet. From the northern side of this mountain the waters are collected into the river Sado, which reaches the sea at Setubal. In the spring the malaria arising from this river is very injurious to the health of the inhabitants. The Sierra de Portalegre rises to 2130 feet; that of Osa, north of Evora, slightly exceeds this height. Nearly the whole country is covered with mountains, but their course is so varied that description would be at once difficult and useless. The harbours of Sines and Villa Nova de Milfontes are of little value. The population is not very industrious, yet corn is produced to such an amount as to contribute largely to the support of Lisbon; but the supply of wine and oil is less abundant. The former is altogether consumed within the province, and a considerable quantity of oil is often imported from the bordering regions of Spain. There are many quarries of marble, white, green, and red. The political divisions of the province are these: it contains the eight *comarcas* or districts of Evora, Elvas, Portalegre, Ourique, Villaviciosa, Beja, Crato, and Aviz. Evora, the chief city of the whole province, is the seat of an archbishopric; and three bishops take their titles from Elvas, Portalegre, and Beja. Elvas is also a place of great military strength, and with the adjoining fortress, La Lippe, protects the frontier on the side of Badajoz.

ALEPPO. [See Haleb.]

ALESSANDRIA, one of the five divisions of the principality of Piedmont, which is again subdivided into the provinces of Alessandria, Asti, Casale, Acqui, Voghera, and Tortona. The whole division is said to contain a population of above 510,000.

The province of Alessandria is intersected by hills of small elevation, the spurs or offsets of the Apennine chain, which divides Piedmont from the Riviera of Genoa: it is not well watered, though it is bounded on the north by the Po, which receives below Alessandria the Tanaro. The Tanaro receives the Belbo a little above Alessandria, and the Bormida (increased by the Orba) a little below it. The chief products of this province are, maize, wine, silk, madder, and the best flax in Piedmont. It contains very little wood. The population is estimated at above 90,000.

ALESSANDRIA, a town and fortress in Piedmont, the capital of the province of the same name, near the conflux of the two rivers Tanaro and Bormida. It was built by the Lombard league in 1168, as a barrier against Frederic Barbarossa and the Guibelines of Asti. It was declared a free city like the others of the league, and was named Alessandria in honour of Pope Alexander III., the protector of the Lombard league and the strenuous opponent of the emperor. In 1174, Frederic, having returned to Italy, besieged the new city, which his soldiers, seeing the houses covered with straw or thatch, called by derision Alessandria *della paglia*, or 'of straw,' an appellation which it has since retained. Frederic, however, after four months was obliged to raise the siege. After the extinction of the Lombard republics, Alessandria came under the power of the Marquises of Montferrat, and finally of the Dukes of Savoy. Its citadel is one of the strongest places in North Italy, and has been repeatedly besieged, and taken and retaken, by the French and Austrians. The whole town was surrounded by an extensive line of fortifications by order of Bonaparte, who wanted to make it his chief stronghold in Piedmont, but, by the treaty of Vienna, the fortifications have been razed, and the citadel alone remains. The town is well built, has a fine square planted with trees, a public library, and some good palaces and churches. The population is above 30,000, who carry on a considerable trade; a well-attended fair is held twice a year, in April and October. There are some manufactures of linen, silks, cotton stockings, cotton handkerchiefs, and woollen cloth. Alessandria is one of the most considerable and lively towns of Piedmont, situated in a wide and fertile plain 70 miles E. by S. of Turin, and 60 N. by W. of Genoa. The field and village of Marengo are within sight of Alessandria on the opposite or right bank of the Bormida, on the road to Tortona; 44° 55′ N. lat. 8° 36′ E. long.

ALEUTIAN ISLANDS, called also Aleutan, Aleutic, or Aleutsky Islands, these several names being derived from the Russian word, *aleut*, which signifies a *bold rock*.

This group of islands is situated in the North Pacific Ocean, between Cape Alaska in North America, and the peninsula of Kamtschatka in Asia; describing a circular arc which extends from 163° of west to 166° of east longitude, and thus comprehends 31° of longitude. The islands which form the two extremities of the chain, viz. Oonemak, which is separated by a narrow channel from Cape Alaska, and Behring's island, which approaches the nearest to the coast of Asia, are both in the 55th parallel of north latitude, while the others extend in a curve towards the south, the centre one of the chain being situated in the 53d parallel.

The first attempt at geographical discovery in this region was planned, a short time before his death, by Peter the Great of Russia, with the view of ascertaining the distance between the Asiatic and American continents. The plan was prosecuted, in the following reign, by a Dane, named Behring, according to the instructions which were drawn up by Peter with his own hand. Two voyages prosecuted in 1728 and the following year, were not attended with success; but a third expedition, undertaken in 1741, was productive of a better result. Behring discovered the coast of America in 58° 28′ N. lat., and on his return to Kamtschatka visited Behring's island, then uninhabited, where he soon after died. This island, which is 104 miles long, with a mean breadth of 15 miles, is, as before stated, in 55° N. lat. and 167° E. long., 190 miles N.E. of the harbour of St. Peter and St. Paul in Kamtschatka.

Behring's island having thus become known to the inhabitants of Kamtschatka, they were led thither in search of sea-otters and other fur-bearing animals; and some of their vessels being driven to the eastward by the storms prevalent in those latitudes, the other islands of the group were successively discovered. Geographers at first divided this Archipelago into three groups, calling those nearest to Asia the Aleutian, those near to the centre the Andrenovian, and those which are nearest to America the Fox Islands. At present all are comprehended under the name of Aleutian Islands. The derivation of this name has already been given; the Andrenovian group were so named in honour of either the vessel—the St. Andrean—in which the discoverers sailed, or of her owner, Andrean Tolstyck. The Fox Islands received their name in consequence of the great number of those animals found upon them.

A survey of the entire chain was made by two Russian officers in 1768, by order of the Empress Catharine, but our knowledge of the islands and of the adjoining coasts of the two continents is principally derived from the narrative of the last voyage of Captain Cook, who, in 1778, determined with accuracy the positions of the islands, and of the more remarkable points of the two coasts.

As early as 1785, establishments, protected by fortifications, were formed by Russian adventurers in many of the islands. These were all the result of private enterprise. The success by which they were attended led to the formation of the Russian American Company, whose operations were carried on during several years in a somewhat irregular manner; but in 1799 the association was invested with considerable privileges by the Russian government, and it still continues to prosecute the trade in furs with much activity.

The traders who first visited these islands are charged with having acted with the most wanton cruelty towards the natives, whose revengeful feelings were at length so far excited, that they seized upon every opportunity for retaliating upon their oppressors, and succeeded on several occasions in destroying the Russian vessels and murdering their crews. Notwithstanding these disasters, other adventurers were still tempted to go in quest of the valuable skins which the islands supplied in such great abundance.

Our celebrated countryman, Cook, when he visited the islands, found the inhabitants disposed to carry on a peaceable traffic with his sailors, and, at the present day, the Aleutians are observed to be generally a kind-hearted and inoffensive race, but when provoked to anger, they prove themselves malignant, implacable, and indifferent to personal danger.

The number of islands which compose the entire chain is very considerable; above forty have received names. The most important of those situated to the eastward—the Fox Islands—are, Oonemak, Oonalashka, and Oomnack. Those composing the Andrenovian division are smaller than the others, and are seldom visited. The principal of them are, Amlak, Atchka, Tshetchina, Ayag, Kanaga, and Takavangha. The two last mentioned have volcanoes, and Tshetchina possesses a high hill which is apparently an extinct volcano. The division nearest to the Asiatic coast contains, among other islands of less importance, Semitchi, Attoo, Agattoo, Copper Island, and Behring's or Commodore Island.

The prospect on approaching any of these places is described by Kotzebue to be frightful and desolate. Black masses of lava appear to rise perpendicularly from the sea to a great elevation, the whole of each island presenting the appearance of pointed mountains lying close to each other, and some of them having their summits above the clouds.

The islands are all of them destitute of trees, and the inhabitants would suffer much inconvenience in consequence, but for the great abundance of drift wood from the American coast which is continually thrown upon their shores. An unsuccessful attempt was once made to plant a species of pine at Oona-lashka.

The coasts of the Aleutian Islands are all so rocky and so encompassed by breakers, that the navigation among them is dangerous. The whole group bears evident marks of a volcanic origin, and on several of the islands are volcanoes in a state of activity at the present time. The soil is in general of an ungrateful nature, but in some few spots where it is of better quality, gardens have been formed in which several esculent vegetables arrive at tolerable perfection. Cabbages, carrots, turnips, radishes, beet-root, and even cucumbers are constantly raised under such circumstances without difficulty. Potatoes have been recently introduced, and appear likely to be of great benefit to the inhabitants.

The islands are amply provided with springs of water, which, in some instances, flow from the bases of the mountains directly into the sea, and in other cases form considerable lakes, the superfluous waters of which are drained off by natural canals.

The land animals which are general on the islands are, bears, wolves, beavers, ermines, and river-otters. The sea-otter, whose skin is held in much estimation by the Chinese with whom the Russians trade, has had its numbers much diminished. Red, grey, brown, and black foxes are seen in great variety on the Fox islands. Seals and whales are abundant on the coasts, and sea-lions are occasionally met with. The kinds of fish most usually caught are, salmon and halibut; the latter of these are sometimes of an immense size.

The valleys of some of the islands furnish an abundance of herbage, which would support a considerable number of cattle throughout the year.

Almost the only occupations of the inhabitants are fishing and hunting, and the preparation of implements necessary for the prosecution of these pursuits. In fishing they make use of a species of canoe, which they call a baidar, and which consists of a skeleton of wood, over which a covering of seal skins is extended. Thus constructed, these canoes are so extremely light that they may be carried about by one person without difficulty. They are long and narrow in form, and are most usually made to hold only one person; sometimes they are calculated to carry two, and very rarely three people. Each canoe has a kind of deck formed of skins, in which, according to the number it is intended to carry, one or more round holes are left just fitted to the size of the body. The islanders are very expert in the management of these vessels by means of double paddles seven or eight feet in length. They sometimes venture in them to a considerable distance from the land, even in very stormy weather.

Domestic occupations, such as making clothes, and even the covering of canoes is performed by the women, who likewise make mats, baskets, and other useful articles of straw.

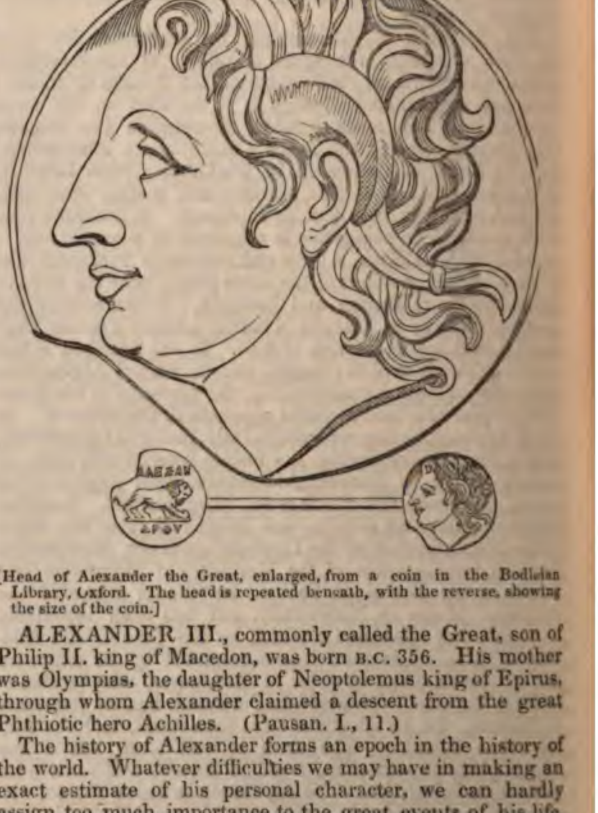
The native inhabitants are mostly short, but stout made and well proportioned. But little difference is observable in the clothing of men and women, which consists of a frock made of seal skin, fastened round the neck and descending below the knees. The same material is employed for making boots. Both the men and women bore their under lips, and by way of ornament, insert pieces of bone in the holes. They likewise ornament their frocks with glass beads, feathers, beaks of sea parrots, or white goat's hair brought from Siberia. They all wear a kind of wooden cap which is dyed, generally green, and adorned with figures carved out of sea-cow teeth, or with beads. The women usually wear rings on their fingers, and bracelets of glass beads above the wrists and ancle joints.

The food of the islanders consists almost entirely of fish and the flesh of sea animals. They provide in summer a store of fish which they dry and lay up in small huts for winter use. A very favourite species of food with them is whale blubber, and this substance, when it becomes too rancid for even an Aleutian stomach, they use for lighting and warming their dwellings. Their habitations are holes dug in the earth and covered with sticks, over which grass and earth are thrown. The entrance is from the roof, whence also light is admitted through a window covered with dried fish skins, and the dwelling is divided into separate apartments by means of seal skins and straw mats, so that each one forms the abode of several families.

The islanders are inclined to be superstitious, and are great believers in charms. Some have been baptized, and make a profession of the Christian religion according to the faith of the Greek church. Polygamy is common, if indeed marriage may be said to exist among a people where the men are accustomed to take as many wives as their means enable them to maintain, and may send them back to their friends to form new connexions when those means are diminished. It sometimes happens that one woman will live at the same time with two husbands.

It is hardly possible to form any estimate of the population of the islands. There is reason to believe that it has very seriously diminished since the settlement among them of the Russian traders. Half a century ago Oonalashka was assumed to contain 1300 inhabitants, while recent accounts estimate the population at only 300 souls. (Cook's *Third Voyage*, Coxe's *Account of Russian Discoveries*, Kotzebue's *Voyages round the World*.)

ALEXANDER. [See PARIS.]



[Head of Alexander the Great, enlarged, from a coin in the Bodleian Library, Oxford. The head is repeated beneath, with the reverse, showing the size of the coin.]

ALEXANDER III., commonly called the Great, son of Philip II. king of Macedon, was born B.C. 356. His mother was Olympias, the daughter of Neoptolemus king of Epirus, through whom Alexander claimed a descent from the great Phthiotic hero Achilles. (Pausan. I., 11.)

The history of Alexander forms an epoch in the history of the world. Whatever difficulties we may have in making an exact estimate of his personal character, we can hardly assign too much importance to the great events of his life, and their permanent influence on the condition of the human race. The overthrow of the great Asiatic monarchy which had so often threatened the political existence of Greece, the victorious progress of the Macedonian arms from the plain of

Thebes to the banks of the Danube, and from the Hellespont, the boundary of rival continents, to the Nile, the Jaxartes, and the Indus—these have formed in all ages the theme of historical declamation, and are still the subject of vulgar admiration. But the diffusion of the language and the arts of Greece, the extension of commerce by opening to Europeans the road to India, the great additions made to natural science and geography by the expedition of Alexander,—these are the real subjects for enlightened and critical research. Of the numerous writers who treated of the campaigns of Alexander not a single contemporary remains; and our information is entirely derived from compilers who lived several centuries after the age of Alexander, and founded their narratives on such contemporary records as then existed. With the exception of Arrian, not one of them was equal to the subject; and even he was often too deficient in knowledge of Asiatic geography to enable him to make a proper use of his materials. The accounts of the different writers, though agreeing in all the great events, offer no small discrepancies when we come to details, and, with the exception of Arrian's *History*, are marked by a general absence of sound criticism. We shall notice these authorities briefly at the end of this article.

If we knew nothing more of Alexander than that Aristotle was his master, the memory of the philosopher would preserve that of the pupil. But it is a rare coincidence to find the greatest of conquerors instructed by the first of philosophers—the master of all knowledge teaching the future master of the world. Some of the great projects of Alexander might pass for the mere caprice of a man possessed of unlimited power, if we did not know that Aristotle had given him lessons in political science, and written for his use a treatise on the art of government. That the pupil amidst all his violence and excesses possessed a vigorous and clear understanding, with enlarged views of the advantages of commerce, and of the nature of civil government, is amply confirmed by some of the most prominent events of his life. Unfortunately Aristotle was not his only master; the flattery of Lysimachus, and the obsequiousness of his attendants, conspired to cherish those ungovernable passions which seem to have descended to him from both his parents.

The military education of Alexander commenced from his boyhood: he was trained to be expert in all manly exercises, and particularly in the management of a horse. His first essay in arms was made at the battle of Chæronea, (B. C. 338,) when his father crushed the united forces of Thebes and Athens with their allies, and established the Macedonian supremacy in Greece.

Philip was murdered (B. C. 336) during the celebration of his daughter's marriage, when he was just on the eve of setting out on his Asiatic expedition, at the head of the combined force of Greece. His sudden death inspired the states which had been humbled with some hope of throwing off the yoke of the Macedonian kings. Alexander, in his twentieth year, succeeded to the monarchy and to the great designs of his father. Though threatened with danger on all sides, from the movements of the barbarians on the north, and the restless Greeks in the south, his courage and address saved him. The Thessalians readily chose him as the head of their confederacy; and the Amphictyons confirmed him in the honours which had been granted to Philip. His next step was to march an army into Bœotia, to check the beginning of insurrectionary movements, by showing himself at the gates of Thebes. His vigour secured for him greater honours than Philip had ever received, and the states of Greece, Lacedæmon excepted, transferred to him, at Corinth, with abject flattery and mean submission, the office of commander-in-chief against Persia, which they had already conferred on his father.

In giving a brief sketch of the chief events of Alexander's short life, we may observe that without a constant reference to maps it is impossible to form any idea of the rapidity of his movements, the natural obstacles which he had to encounter, or the immense extent of country which he overran in a few years. All military history without geographical detail is only a heap of confusion, and that of Alexander still waits for more complete illustration from the researches of modern times.

In order to leave no troublesome enemies behind him, he resolved to reduce the barbarians of the north to obedience. From his residence in Macedonia he marched (in the spring of B. C. 335) in ten days to the passes of Mount Hæmus, (the Balkan,) crossed them in spite of the opposition of the natives, and descended into the great plain of the Danube. Here he defeated the Triballi; and after crossing the Danube at a point which it is now impossible to determine, he struck terror into the Getæ, who lived on the northern bank, by the rapidity and decision of his movements. On his return, he led his troops against the Illyrians and Taulantii, whom it was necessary to reduce to submission before he could safely quit his kingdom. A false report of his death, during this expedition, gave the Greeks once more hopes of throwing off the hated yoke of Macedon; and the Thebans set the example, by murdering two officers of the Macedonian garrison, which had occupied the Cadmeia or Acropolis of the city ever since the battle of Chæronea. But while they were indulging in the anticipation of recovering their independence, their ever-active enemy made his appearance before their city. It appears as if Alexander would have been satisfied with a reasonable submission, but party violence in Thebes prevented all concession, and the proposals of the Macedonian king were rejected with insult. After a short resistance Alexander's troops entered the city, when one of those horrid scenes of carnage ensued which form a necessary part of a conqueror's progress. It was then that the Phocians, with the Platæans and other Bœotians in the army of Alexander, inflamed by the remembrance of what they had once suffered from this unprincipled city, slew all before them, 'even those who made no resistance; they murdered the suppliants in the temples; they spared neither woman nor child.' (Arrian, I. 8.) The number killed is stated at 6000, which may possibly be exaggerated: the survivors were sold for slaves, except the ministers of religion, and the few who were the friends of the conqueror or who had opposed the revolution: the temples and the house of Pindar, it is said, were spared; but all the rest of the city, except the Cadmeia, was levelled to the ground, and Thebes for the present was blotted out of Greece. (B.C. 335.) Alexander did not march farther south, though the Athenians had been active in organizing the late resistance. One such example was sufficient for a warning.

In the spring of B.C. 334, Alexander set out on his Asiatic expedition with a force of about 35,000 men, and a very small supply of money. The largest component part of his army was Macedonian, with about 7000 allied Greeks, some mercenary troops, and several bodies of Thracians, 1500 Agrianian light infantry, and some other bodies of troops. His cavalry, on which his success in a great measure depended, was mainly composed of Macedonians and Thessalians.

Having arrived at Sestos in twenty days, and crossed the narrow channel of the Hellespont, the descendant of Achilles and his friend Hephæstion did honour to the mounds that were said to contain the remains of the mighty hero and his beloved friend Patroclus. Youthful enthusiasm may have been one motive to the display made before the army on this occasion, but it was no less a part of Alexander's policy to induce his followers to look upon him as the representative of the greatest warrior of the heroic age.

At the period of Alexander's landing in Asia, the unwieldy and disjointed monarchy of the Persians presented an appearance in every respect analogous to the Turkish empire at present. The Persians themselves, the ruling caste, were comparatively few in number. One monarch with absolute power claimed the sovereignty of almost countless nations, and of an immense extent of country, the parts of which were in many cases separated by natural boundaries which were difficult to pass. The provinces that lay remote from the seat of government could only be maintained by the presence of an armed force under a military governor nominated by the king. The partition of the empire and the distribution of power were therefore essential to the very existence of the Persian monarchy: but this system was also the remote cause of its weakness and dissolution. Each powerful governor was kept in submission by no other motive but fear of punishment; and when he felt himself able to defy his master, the bond of union was for the time broken. Hence some provincial governments passed quietly from father to son, the monarch tacitly consenting to an arrangement which he could not prevent. Darius, the king of Persia, who was contemporary with Alexander, seems to have been ill qualified to retrieve the falling fortunes of the monarchy: he was deficient in courage and military skill, and had no hope of opposing the invader but by turning against him the arms of the Greeks themselves.

From the time of Cambyses, the son of the first Cyrus, to the age of Alexander, we find renegade Greeks constantly in the pay of the Persian monarch, ready to serve their new paymaster against those who were united to them by kindred and language. The civil commotions which so often disturbed the peace of Grecian communities were also continually driving refugees to seek from the king of Persia the rank and property which they had lost at home. At this time the hopes of Darius rested on Memnon, a Greek of Rhodes, whose military skill might have made him, with better opportunities, a formidable opponent to the Macedonian king. The first combat between the invaders and the Persians was on the banks of the Granicus, (now perhaps the Oostvola,) a river which falls into the Sea of Marmara. The Persians possessed an elevated position on the east bank of the river, which their generals determined to defend, contrary to the advice of Memnon, who being, as it appears, not in the command, could only recommend for the present the safer expedient of a retreat. But the dispositions of the Persians were totally unsuited to oppose the violent attack of Alexander's cavalry, which crossed the river and maintained itself on the opposite bank until the light infantry that followed had time to come up, when the compact front of the Macedonians bristling with their formidable spears broke the less disciplined lines of the Persian cavalry, and secured a complete victory. To the daring personal courage of Alexander, who himself killed two Persians of the highest rank, and to the long spears of the Macedonians, the victory may be mainly attributed. The Greek infantry in the Persian army was cut to pieces, with the exception of 2000, who were sent into Macedonia in chains, and condemned to slavery. Alexander showed, after the battle, that he knew how to win affection by flattering self-love, as well as to lead men to conquest. He visited his own disabled soldiers, listened to the tale of their exploits and their wounds, and gave to the parents and children of those who had fallen privileges of distinction and immunity from civil burdens. Twenty-five horsemen belonging to the Companion cavalry, —a kind of military order, perhaps instituted by Alexander, —had fallen in the first assault: Lysippus, the famous sculptor, was ordered to make their figures in bronze, which were placed in the town of Dium in Macedonia, and afterwards adorned one of the public buildings of Rome.

This success was of the utmost importance to Alexander, by preparing the submission of most of the Greek towns on the Ægean, in which he adopted the policy of establishing democratic forms of government, with the double purpose of showing that he had come as the liberator of the Greek states, and perhaps, too, with a view of preventing their combining against himself by the constant occupation which they would have in quarrelling with one another.

To crowd into the compass of a short article the military operations of Alexander's campaigns would be a useless attempt: even Arrian's narrative is often too meagre and unsatisfactory to enable us to form a clear conception of the events. Nothing but a careful examination of a map, and some idea of the nature of the country, can give a reader any notion of the vigour of the Macedonian general. One of the most memorable events between the battles of the Granicus and Issus was the capture of Halicarnassus in Caria, which Memnon only left when it was no longer possible to hold out. This memorable siege is minutely described by Arrian, whose personal experience (see ARRIAN) enabled him to detail the military events of Alexander's life better than the compiler Diodorus or the rhetorician Curtius.

The progress of Alexander southward was marked by an event in which the durable features of nature bear evidence to the truth of history. In proceeding from Phaselis to Perga he sent part of his troops by a newly-made but difficult route in the interior; he himself proceeded along the shore of Lycia, where the mountains rise from the sea step by step like a ladder, leaving between the base of the ladder (or *climax*, as the Greeks called it) and the sea, a beach which offered a shorter and much more convenient road. The projecting cliffs, however, over which there appears to have been at that time no way, would render it necessary for the men in some places to wade through the water, though not without danger; but a favourable opportunity was offered for accomplishing this, by the depression of the sea in this part, consequent on the blowing of a north wind. (See Beaufort's *Karamania*, p. 116. Arrian, I., 26.) Among the numerous writers of Alexander's history there were not wanting those who embellished it with stories of miraculous interpositions, and unmeaning flourishes of rhetoric, in which they showed at once their own ignorance of the character of the country traversed by Alexander, and reckoned on a corresponding ignorance and credulity in their readers.

After gaining the strong post of Celænæ, near the source of the Mæander, the Macedonian general marched to Gordium in Phrygia, (B. C. 333) where he had another opportunity of turning to profit the belief of a superstitious age. The empire of Asia was promised to him who should untie the complicated knot which fastened to the pole of a chariot the yoke and collars of the horses. Alexander relieved himself from the difficulty, either by cutting the cord, or some equally expeditious process. The promptitude of his resolution, and the presence of a victorious army, could not fail to secure him the credit of having fulfilled the intentions of the Deity.

The army was now increased by fresh reinforcements from home, and the return of the new married soldiers who had been sent to winter in Macedonia. In approaching the passes which lead from the central plateaus of Asia Minor into the plains of Cilicia, Alexander must have been in the track of the Greeks who accompanied the younger Cyrus in his expedition against his brother, not quite a century before; and the march from the mountain pass to Tarsus (the modern Tersoos) on the Cydnus, probably followed the same route. A remarkably narrow defile, about twenty miles north of Tarsus, which is cut in the rock, has been conjectured to be the pass described by Xenophon and Arrian. At Tarsus the career of Alexander was nearly terminated by a fever, either caused by fatigue, or by throwing himself when heated into the cool stream of the Cydnus. A similar act of imprudence at Tersoos is said to have been fatal to the Emperor Frederick Barbarossa.

A little before this time Memnon died, and with him the best hopes of Darius. This skilful commander, at the time of his death, was in the Ægean with a powerful fleet, to which Alexander had nothing to oppose: he was master of Chios, the chief part of Lesbos, and ready to fall on Eubœa and Macedon, with the prospect of being supported by the Lacedæmonians. His sudden death relieved Alexander from an opponent whose operations in Greece might have compelled him to give up the dazzling prospect of Asiatic conquest.

From Tarsus Alexander marched, partly by the route of the younger Cyrus, along the Gulf of Issus to the little town of Myriandrus in Syria. Darius had for some time occupied an extensive plain in Syria, well adapted for the evolutions of his large body of cavalry, and for the disposition of his immense army. Contrary to the advice of Amyntas, a Greek deserter, he abandoned this position for one in which defeat was almost certain. An offset from the range of Taurus runs down to the Gulf of Issus, (the modern Gulf of Skanderoon,) and terminates in the high land of Cape Khynzyr. The mountains press close on the shores of the Gulf of Issus, leaving in some places a plain barely large enough for the battle-ground of an army: in one particular spot the passage is so narrow as to be capable of an easy defence. By this unguarded pass Alexander had advanced into Syria, while by another pass farther north in the mountain range, Darius moved from Syria to the plain of Issus with the river Pinarus in his front. He was now in the rear of Alexander; but he had engaged himself in a position where victory might be confidently expected by the Macedonians. Alexander marched back through the Syrian pass, and found the Persian king prepared for battle in the plain of Issus. The left wing of the Macedonian army was protected by the sea, and the dispositions on the right were such as to prevent the superior force of the Persians from effectually out-flanking the Greeks on that side. The Persian king, though possessing a far superior force, waited the attack on the opposite bank, as if conscious of his inferiority, and anticipating a defeat. Alexander himself, who was on the right wing, crossed the stream, attacked the Persians with impetuosity, and soon put their left wing to the rout. The 30,000 Greek mercenaries in the Persian army offered a stout resistance to the main body of the Macedonians; and the Persian cavalry on the right, who were opposed to the Thessalians, fought bravely as long as their king remained on the field of battle.

The Persian king himself gave the signal for flight when he saw his left wing entirely routed; and the cavalry, soon following the example of their leader, turned their backs with the rest of the army. The slaughter, though perhaps exaggerated, must have been prodigious, from the nature of the ground; and Ptolemy, the future king of Egypt, who was in he battle, relates that in one narrow pass the pursuers crossed the road on the upheaped bodies of the slain. Darius succeeded in escaping over the Euphrates by the usual ford at Thapsacus, (35° 20′ N. lat.) but his mother, wife, and his infant son, who had attended him to the field of battle, fell into the hands of the conqueror, and experienced from him the most humane and respectful treatment. This victory (about the close of B.C. 333 may be considered as having decided the fate of the Persian monarchy: it opened to Alexander a passage towards Egypt and Babylon, and checked the designs of Agis and Pharnabazus in Western Asia and the Ægean. One obstacle only lay in the way, which proved more formidable than the armies of Darius. A single day was sufficient to disperse a numerous army, but the labours of many months were necessary for the capture of Tyre. This great commercial city was situated on an island (33° 12′ N. lat.) separated from the mainland by a channel about half a mile wide; which, on the side of the continent, was shallow and muddy, but had about eighteen feet water close to the island. The sland itself was defended by lofty walls, and well supplied with all the ammunition of war. For many centuries this wealthy city had been the great entrepôt between the eastern and the western world; and through it the inhabitants of Europe had long received those Asiatic products which we find mentioned in the oldest Greek writers. Her commerce and her ships had penetrated to all known seas; and her adventurous traders, through many intermediate hands, received he products of countries which the Tyrians themselves never visited. Her merchants were princes, and her warehouses were stored with all that contributes to national wealth and domestic comfort. We find in the twenty-seventh chapter f Ezekiel a most glowing picture of the prosperity of this great emporium, expressed with all the sublimity and trength of the ancient Hebrew poetry. (See Volney's xplanation of this chapter.—*Syria*, chap. xxix.)

The cities of Phœnicia submitted to Alexander on his aproach, and the ancient Sidon yielded without a blow; but Tyre, proud of her naval superiority, refused to grant all hat was demanded, and prepared for a vigorous resistance. lexander, in order to assault the place, was compelled to nite the mainland and the city by a causeway, which was ot effected without great labour and difficulty. It is said at Nebuchadnezzar had taken the city by the same means; ut, if the story is true, his causeway must have been of such nature as to be easily removed. It is more probable that e island was not occupied till after the old city, which was the mainland, had been taken by Nebuchadnezzar. Alexder's work still remains, and the island of Tyre is now part the mainland. After a laborious blockade of seven months, e place was taken by storm, and the impatience of the beging army was gratified by the slaughter of 8000 Tyrians; ,000 more were sold into slavery; and, if we trust the authoy of Diodorus and Curtius, the conqueror was guilty of the human act of crucifying 2000 men on the sea-shore. The st bulwark of the Persian monarchy was now gone, and e dominion of the sea, as well as of the land, was in the nds of the Macedonians. Under the Persian monarchy yre enjoyed favour and privileges, on condition of furnishing e main part of the navy in all the wars with the Greeks; condition to which the Tyrians probably were not averse, it gave them additional means for crushing the Greeks, hom they hated as their rivals in the commerce of the Meterranean. The siege of Gaza, one of the strong towns of Palestine, occupied Alexander for two months; but the obstinate defence of the inhabitants did not preserve the city om being taken, nor the women and children from being old into slavery.

After the sieges of Tyre and Gaza, according to the authority of Josephus, Alexander marched to the holy city of Jerusalem, intending to punish the inhabitants for their efusal to supply him with troops and money. The High-priest Jaddus went forth to meet the conqueror, attended by he priests and people, and accompanied by all the imposing nsignia of the Jewish religion. Alexander was so struck with this spectacle, that he pardoned the people, adored the name of the Most High, and sacrificed in the temple, accordng to the directions prescribed to him by Jaddus. The Book of the Prophet Daniel was shown to him, and the passage pointed out in which it was foretold that the King of Grecia should overcome the King of Persia. With this, as the historian says, he was well satisfied, interpreting himself to be the person foretold by the prophet. The story appears only like another version of the visit to the Temple of Ammon, in Libya; and will not, in our opinion, bear the test of examination. Arrian says nothing about it. (See S. Croix, *Examen Critique*, p. 547, &c.)

Nothing now remained to check the march of Alexander into Egypt, which yielded without striking a blow. In seven days the army marched from Gaza, through the desert to Pelusium, the frontier town of Egypt on the east. The Persian governor found resistance hopeless, and the country passed at once under the dominion of the Greeks, an event to which circumstances had been long gradually tending. From the time of Amasis (B.C. 560) the Greeks had received permission to settle in Egypt; and, at the time of Alexander's invasion, there can be no doubt that the country contained a very large proportion of that nation. Under Persian government Egypt had always been an unruly and troublesome province, and the contest for the possession of it, between the Greek and Persian, and the Persian and Egyptian, had more than once been doubtful. The Egyptians hated the Persians for their religious intolerance, and the desecration of their temples, while the more accommodating Greek readily associated his own with the religious usages of the Egyptians, and was willing to assign to both a common origin. From Pelusium Alexander visited the sacred city of Heliopolis, renowned for its temples and obelisks, and Memphis, then the great capital of Egypt; south of this point we have no reason for supposing that he ever went. He next sailed down the Canopic, or western branch of the Nile, and entered the lake of Marea, where he founded the city of Alexandria, which still preserves his name. (See ALEXANDRIA.) From motives of policy, vanity, or curiosity, or perhaps under the influence of all three, Alexander determined to visit the far-famed temple of Ammon, an object of religious veneration to the Egyptians, and also probably, as it now is, the centre of a considerable trade. The site of this curious spot is now ascertained to be Siwah, (29° 12′ N. lat. 44° 54′ E. lon.,) where the ruins of a temple, and the hot springs, confirm other evidence as to its locality. (See AMMONIUM.) Alexander marched along the coast by the same route that Mr. Brown followed in 1792. This road is preferred to the more direct route on account of the better forage for cattle which it affords; and, on the whole, it presents no very formidable difficulties. After a march of seventy-five hours along the coast from Alexandria westward, Mr. Brown proceeded into the interior in a south-west direction. Alexander's march along the coast terminated at Parætonium, a point somewhat beyond that reached by Brown. The English traveller's account of the route from the coast to Siwah agrees with that of Alexander, as given by Arrian. It was through a country 'perfectly barren, consisting wholly of rocks and sand.' Arrian's description of Alexander's interview with the priests, and his notice of the oracular responses, are limited to a general remark, which shows that he did not think the story worth telling. Other authorities inform us that Alexander was honoured with the title of the Son of Jupiter, and a promise of the empire of the world. There is a remarkable discrepancy in the accounts of Ptolemy and Aristobulus, as to the route by which he returned. Ptolemy says that he took the short cut through the desert to Memphis, while Aristobulus asserts that he returned by the way that he came.

Alexander having received some reinforcements from Greece, and established the government of Egypt on a wise and liberal footing, set out to attack the Persian king, who had again collected a considerable army. In the spring of B.C. 331, he marched to Tyre, where he made some stay; from thence to the ford of Thapsacus on the Euphrates, and across Mesopotamia to the Tigris. Such a march makes but a small figure in the brief narrative of Arrian, and is but an inconsiderable part of the military operations of Alexander: it amounts, however, to above 800 miles. The king crossed the Tigris, and, advancing through Aturia, found Darius encamped on the banks of the Bumadus, near a small place called Gaugamela, or the *Camel's House*. The immense disproportion between the Persian and Grecian armies was no disadvantage to the less numerous, but better disciplined force of Alexander, though the victory was not obtained without a struggle. As on former occasions, many divisions of the Persian army behaved with courage, and the Asiatic cavalry made a strong resistance; but the early flight of the timid king left the Macedonians a certain victory. Darius fled to Ecbatana (Hamadan) in Media; and Alexander, who no longer had any reason to fear such an opponent, marched unmolested to take possession of Babylon, and the empire of Asia. This battle is more commonly known by the name of the battle of Arbela, (now Erbil,) up to which city Alexander pursued Darius. Arbela is between forty and fifty miles east of Gaugamela.

The battle of Arbela may be considered as an epoch in the life of Alexander. Though Darius was still alive, he could no longer be considered as king; his power was crushed; the fairest part of his empire had submitted; and the progress of the conqueror was henceforward attended with almost immediate submission. But the conduct and temper of Alexander began to undergo a change. Intoxicated with success, he gradually assumed the state and manners of an Asiatic sovereign; and, unrestrained by habits of self-control, he gave way to the most guilty excesses, which, if we trust the evidence of history, it is equally futile to palliate or deny.

The ancient city of Babylon, which had so long resisted the first Cyrus, and the first Darius, yielded, without a blow, at the approach of Alexander. The Macedonian adopted a more prudent and generous policy than the Persian monarchs, whose fanaticism and intolerance to foreign religions are hardly exceeded by that of the followers of Mohammed. Xerxes had ruined the temples of Babylon, and even had dared to profane the shrine of the Great Bel, and to murder the high priest. Alexander gave orders to restore the temple of the deity, and showed himself a worthy proselyte, by sacrificing to Bel, according to the rites prescribed by his ministers the Chaldeans.

A march of twenty days brought the Macedonians from Babylon to the banks of the Choaspes, (the Kerah,) on the east side of which stood the city of Susa, (Sus,) then the chief residence of the Persian kings, and the depository of their treasures; now only remarkable for its extensive ruins, which spread for several miles along the banks of the Kerah.

From Susa the active monarch advanced to the Pasitigris, (the Karoon,) and thence by the route which Timour afterwards followed, along the valley of Ram Hormuz, to the mountain pass (Kala-i-Sifid, the *white castle*,) which led into Persia Proper, (Fars,) the original seat of the Persians. His object was to surprise Persepolis, in which he succeeded; and, according to some accounts, he burnt the palace of the Persian kings in a fit of drunken madness, and at the instigation of Thais, an Athenian prostitute, who accompanied the army. It is difficult to believe all the circumstances as they are related; and it is almost certain that the real destruction of Persepolis belongs to the Mohammedan epoch. Under the name of Istakhar it is often mentioned by oriental writers; and the immense remains of Tchil-Minar, (the forty columns,) perhaps once the palace of the Persian kings, have been described and copied by various modern travellers. Persepolis was a kind of sacred city to the Persians; the former capital of their early empire, and the burying-place of their monarchs after the seat of government was removed to Susa and Ecbatana.

From Persepolis Alexander marched to Ecbatana, (B.C. 330,) but not by a direct route. On his approaching the city Darius fled past the ancient Rhagæ, and through the passes of the Elburz mountains, (Caspiæ pylæ,) to seek a refuge in his Bactrian provinces. In fact, he was now a prisoner in the hands of the Bactrian satrap Bessus, who accompanied him in his flight, and assumed the command. At Ecbatana the Thessalian cavalry and many of the allied troops having terminated their period of service, were honourably dismissed with full pay and presents. Some who preferred a life of adventure were enrolled as volunteers. The Thessalians sold their horses to the king, and with the rest of the Greeks received a safe convoy to the shores of the Mediterranean.

The march of Alexander from Rhagæ, (the modern Rey, whose extensive ruins lie near Tehran,) to his entrance into India, is the most obscure part of his history. The geography of those regions is still very imperfectly known to us, and the brief narrative of Arrian, our sole trustworthy authority, only enables us to form a general idea of the movements of the army. Alexander penetrated into regions where no European army has yet followed him, and few travellers have ventured to explore. The surprising rapidity of his movements and his capacity to endure toil, are not surpassed by what is recorded of Genghis Khan and Tamerlane, though we may readily admit that Arrian in this part of his work may have exaggerated, and fallen into error from unavoidable ignorance of the country. It is the same with distance as with time; both of them are unfavourable to clear perception. As the history of a remote age is comprised in a few words, so the immense spaces of Asiatic geography dwindle into insignificance, and leave no impression on the reader. But nothing is wanting, except a clear conception of the distances traversed by Alexander, and the obstacles encountered, to convince us that of all the conquerors who ever troubled the peace of mankind, he was the most unwearied and daring.

From Rhagæ the Macedonian commander passed through one of the defiles in the Elburz mountains, commonly known by the name of the *Caspian Pass*, and in one night accomplished, while pursuing Darius, a distance of 400 stadia through the arid wastes of Parthia, with foot-soldiers mounted on horses. Just as Alexander was coming up with the fugitives, Bessus took to more hasty flight, while two of his Persian attendants assassinated their unfortunate monarch, and made their escape with 600 horsemen. Alexander sent the body to Persepolis to be interred in the tombs of the Persian kings.

The army now advanced into the ancient Hyrcania, comprising a part of the modern Mazanderan, a country hemmed in on one side by lofty wooded mountains, and on the other stretching down in a sloping plain to the great inland waters of the Caspian. The king's object was to gain over the remnant of the Greeks, who had served in the army of Darius, for his progress eastward might be dangerous, and the occupation of the conquered provinces insecure, if he left in his rear a body of armed Greeks. After some negotiations, they came and surrendered at his camp, and Alexander had the good policy to pardon all, and to take a great many of them into his pay on the same terms as they had served the Persian king. Some Lacedæmonian ambassadors to king Darius, who surrendered at the same time, were put in chains. In Zadracarta, the capital of Parthia, (a city whose site is totally unknown,) Alexander stayed fifteen days: his next progress was towards the frontier of Areia, along the northern verge of the great salt desert, and to Susia, (Toos?) a city of Areia. According to a policy often successfully imitated, he left the government of Areia in the hands of the Persian satrap Satibarzanes, and prepared to lead his soldiers into a still more remote land. The traitor Bessus had fled into Bactria, (Bokhara,) one of the remotest possessions of the Persian monarchy, where he had rallied round him a few Persians, and a considerable body of the natives of the province. He had assumed the royal name of Artaxerxes, and placed the tiara[*] erect on his head, the symbol of Persian sovereignty. A new claimant thus arose to the empire of Asia. Alexander set out towards Bactria, but was speedily recalled by the news of Satibarzanes having revolted almost as soon as his master had turned his back. With a body of cavalry, and mounted spearmen, and his ever-faithful Agrianians, the unwearied king returned before he was expected: in two days he marched 600 stadia, and entered Artacoana, (Herat?) the capital of the province, to which he gave a new ruler. His course, which seems to have been changed by this unexpected revolt, was now bent to the country of the Drangæ, or Sarangæ, and to their capital. The limit of this march, in this direction, it is impossible to determine; but we must look for the country of the Drangæ on the banks of the great Helmund, which flows into the lake of Zerrah.

Here one of those events in Alexander's life must be briefly noticed, which cast the darkest shade on his character. Philotas, the son of Alexander's faithful general Parmenion, was accused of conspiring against the king, and of having long harboured treacherous designs. The charge *may* be true; at least Philotas was tried by his Macedonian peers who pronounced him guilty, and carried the sentence into execution by transfixing him with their spears. The father was absent in Media at the head of an army. A letter from Alexander, conveyed by one of the companions to three other commanders in Media, contained the sentence of Parmenion. It was thus that a Persian king used to issue his decrees of death against a governor, whom he had reason to fear; and the same sanguinary policy, the offspring of fear, was the only remedy that a Turkish sultan would have applied in a similar case. No proof of Parmenion's guilt is brought forward, and the absence of all real charge against *him*, tends rather to show that the tyrant had basely murdered the son, and feared the just resentment of the father.

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[*] This upright head-dress is humorously compared by the comic poet Aristophanes to a cock's comb (Birds, 487.) The reader may form an idea of what is meant by looking at a newly published print of the combat of Alexander and Darius from the ruins of Pompeii.

The army now advanced, probably along the valley of the Helmund, to the Ariaspi, a people to whom the first Cyrus had given the name of Orosangæ or benefactors, (Euergetæ,) for their aid in his Scythian expedition. Their civilized manners secured to them the favour of the second great conqueror of Asia. The Arachoti, sometimes called the White Indians, a people who live west of the Indus, and south of the great mountains, were subdued by Alexander: these operations, as well as the complete conquest of the Areii, were accomplished in the winter time, 'in the midst of much snow, want of provisions, and hard suffering on the part of the soldiers.' Nothing but the general's own capacity of endurance could have maintained the discipline of his army. Were the history of this campaign more minutely known, we might, perhaps, find a parallel to the unconquered endurance of the Macedonian king, in Charles XII., amidst the marshes of the Ukraine, and a contrast in the hasty retreat and abandonment of his army, by the greatest conqueror of modern times. Alexander in his progress to the mountains built a city, which he called by his own name Alexandria, supposed by some to be the modern Candahar; this, however, we may dispute. His course now lay over the Caucasus, as his historian terms the western part of the Hindoo Coosh, (Cau-Casus — Ko-Koosh,) the mountain range that here separates the waters that flow southwards or into the ocean from those that contribute to the lakes of central Asia. The greater part of the mountains were lofty and bare of wood, but the residence of a great number of people who here found food for their cattle. Bessus laid waste the country on the north side of the mountains, in order to impede the progress of his pursuer; 'but,' to use the simple and energetic words of the Greek historian, 'Alexander moved forwards not a bit the less: with difficulty, indeed, through deep snow, and without provisions; but still he moved on.'

On the nearer approach of Alexander (B.C. 329), the Persian satrap crossed the Oxus, burnt his boats, and retreated to Nautaca, a town of Sogdiana, the modern Mawarennahr. Alexander advancing took in succession Aornos and Bactra: the latter is conjectured to be near the modern site of Balk, which lies on the line of road that the conqueror probably followed. The Oxus is described by Arrian as the largest river crossed by Alexander except the rivers of India, and as flowing into the Caspian Sea, [see AMU;] its breadth was about six stadia, which proves that Alexander crossed it about the melting of the snow on the mountains in May or June; the current was deep and rapid, and its banks offered no materials for constructing boats or rafts. In five days, however, Alexander passed all his army over by means of floats made of the tent skins of the soldiers stuffed with dried reeds and grass (Arrian iii. 29. Compare Xenophon, *Anab.* i. 5.) Before crossing this mighty stream and entering on a new world, he sent home his disabled Macedonians, and such of the Thessalian volunteers as were no longer fit for service. The traitor Bessus fell into the hands of Alexander soon after he had crossed the river; after being kept a prisoner for some time, his nose and ears were cut off by order of Alexander, and he was sent to Ecbatana to be put to death. Arrian, like an honest chronicler, condemns this barbarous punishment; the conqueror, intoxicated with success, debased himself by ordering those cruel mutilations, of which ancient and modern Persian history present such frightful examples. Alexander had now assumed the insignia and the state of an Asiatic despot, and it would be difficult to distinguish his future conduct from that of any other conqueror who has been the scourge of Asia.

From the Oxus the army marched to Maracanda, (Samarcand,) the royal city of Sogdiana, and at a later period the seat of the wise and vigorous government of Tamerlane. The impetuous Macedonian still advanced eastward till he reached the banks of the Jaxartes, (the Sir,) which he proposed to make his frontier against the Scythians, or the nomadic tribes, occupying the country now possessed by the Kirghiz. After taking several cities to which the inhabitants had fled for refuge, he at last assaulted Cyropolis on the Jaxartes, a town which claimed for its founder the great Cyrus. This place is conjectured to be Khoojund, but it must be remarked that the measurement of distances and the fixing of positions in this part of Asia are yet entirely conjectural. When the actual geography of these regions has received that illustration which we are daily expecting, we may then venture to illustrate the descriptions of antiquity. After taking Cyropolis, Alexander crossed the river, defeated the cavalry of the Scythians, and pursued them under the burning heat of a Bucharian summer. The army was exhausted by thirst, and the commander himself was compelled to recross the river in consequence of illness, caused by drinking the unwholesome water, the only kind that is found in these arid steppes. A city founded on the banks of the Jaxartes, which bore the name of Alexandria, was designed to commemorate the limit of his conquests, and to serve as a frontier against the nomadic tribes. It would be unprofitable to detail minutely the operations of the army in a country of which most readers know as little as of the interior of New Holland. Alexander recrossed the Oxus, and spent the next winter (of 329 and 328 B.C.) at Bactra or Zariaspa. Here Arrian relates the story of Cleitus's death. It was during a festival in honor of Castor and Pollux, and the drunken revellings which followed, that Alexander murdered his friend Cleitus. Arrian remarks that Alexander, among other Asiatic customs, had adopted the Persian fashion of hard drinking, while the miserable flatterers, by whom he was surrounded, encouraged his vanity by exalting him above the demi-gods and heroes of Greece. Cleitus, who was drunk himself, had the boldness and imprudence to deny Alexander's claim to such extravagant honours, and the furious king, whom his attendants were unable to restrain, pierced his friend through with a javelin on the spot. Unavailing honours to the dead, and bitter remorse on the part of the murderer, were the natural termination of this tragical story.

In the spring of 328 Alexander recrossed the Oxus at a place marked by a fountain of water and a fountain of oil, (naphtha?) which, if discovered, might throw some light on the course of the army. He paid a second visit to Samarcand in order to tranquillize the country, and spent the severe season of the next winter in quarters at Nautaca; the cold of this region rendering winter operations impracticable. In the following spring (B.C. 327) he assaulted a strong natural fortress in which Oxyartes the Bactrian had deposited his wife and daughters. The place was almost inaccessible, and well furnished with provisions; and in addition to this, a recent fall of snow had rendered the scaling of the rocks more difficult. By means of the iron pins used for securing their tents, and strong ropes of linen, some adventurous soldiers ascended the steepest face of the fortress by night, and by the suddenness of the surprise frightened the garrison into a surrender. Alexander thus not only got possession of the strongest post in Sogdiana, but he found there a wife in Roxana, the daughter of Oxyartes, whom his followers pronounced to be the handsomest woman they had seen in Asia, after the wife of Darius. We have but few and doubtful traces of Alexander being much devoted to the fair sex. His conduct to the wife of Darius may have proceeded from indifference, though it is more charitable, and, perhaps, more true, to assign it to a generous feeling for a female whose husband's feebleness and misfortunes were more likely to excite pity than the wish to insult his fallen fortunes. Roxana was the daughter of a Bactrian prince, but to which of the tribes now found in Bucharia this wife of a Greek king belonged, it is impossible to say. The Tadjiks, who are considered the aborigines of Bucharia, are a handsome race, with European features, fine eyes, dark hair, beautiful teeth, and a good complexion: among their women there are some whom the conqueror of Asia might gladly make his wife, and his soldiers might approve the choice. After capturing another almost impregnable fort, Alexander moved southward about the end of spring, crossed the Caucasus, (Hindoo Coosh,) and in ten days arrived at Alexandria. It is impossible that ten days' march could have brought him from Balk to Candahar; nor, if we reckon the ten days from the crossing of the mountains, can we even then admit that he marched to this city; it is most probable, then, that the time is incorrectly given, for there are stronger reasons for supposing that Candahar was the Alexandria than any other known place. The memory of Alexander is still preserved among the ignorant inhabitants of Bucharia where a molla reads in the public place to a numerous audience assembled around him, the exploits and adventures of Iskander the Great.

The winter residence in Bactra had been marked by new executions. A conspiracy was formed among the royal pages to murder the king, but, being discovered in time, Hermolaus and his young associates suffered the punishment of death by stoning, after having first been put to the torture. Callisthenes, a pupil of Aristotle, was implicated in the charge; he was first tortured and then hanged. There seems no doubt about the existence of a conspiracy, and as little doubt that it was provoked by the intemperate conduct of Alexander. (See Arrian, iv., 13, 14.)

The progress of the army from Alexandria to the passage of the Indus is difficult to trace, though we can have no doubt that it followed, in part at least, the line of an existing commercial road, and would be pretty near the same route that would be followed now. In his march Alexander crossed the Choes or Choaspes, (the river of Caubul?) and the Gyræus, both of them then considerable streams; he took the important town of Massaga, (Massagour,) and once more assailed one of those mountain fortresses, by name Aornos, which seems, from the peculiar difficulties which it offered, to have had additional charms for the adventurous spirit of Alexander. The place was captured in spite of a vigorous resistance; and the army advanced, by a road which they were obliged to construct for themselves, to the bridge of boats over the Indus which Ptolemy and Hephæstion had been sent forward to make.

Neither Aristobulus nor Ptolemy have informed us, says Arrian, how the bridge across the Indus was constructed: he conjectures, however, that it was made by boats, fastened together with planks laid across them, and the whole kept steady by baskets full of stones let down from the prow. Such a bridge of boats there is now at Attock on the Indus, a little north of which is probably the place where Alexander crossed. The river here is above 1000 feet wide, and very deep. It is only from November to April that such a bridge can be thrown over the river, for this is the period when it is not flooded. Alexander, who had spent the winter between the Caubul and the Indus, must have entered India early in the year B.C. 326. His route was the same as that of Timour and Nadir Shah, the object of whose plunder was the city of Delhi.

The region which the Macedonian conqueror now entered is watered by numerous large streams, whence it receives the Persian name of PENJ-AB, or the *five rivers*. The waters of the Penj-âb unite in one stream, and fall into the Indus on the left bank in 28° 55′ N. lat. Taxila was the first Indian town he came to, and here the army enjoyed a little repose after its toils. Taxilas, the king, had saved himself by previous submission; and it seems not unlikely that the dissensions among the Indian rulers of this country materially facilitated the operations of the Macedonian army. Alexander's progress was towards the Hydaspes, (now the Behut, or Bedusta, also called by the natives the Jylum,) a large river swollen by the solstitial rains. His boats that had been constructed on the Indus had been taken in pieces, and brought across the country to the bank of the river; but a more formidable enemy than the swollen Hydaspes presented itself on the opposite bank. Porus, an Indian king, one of the great rulers of the Penj-âb, was stationed there with a formidable army, and a train of elephants that rendered all attempts at landing too dangerous to be hazarded. By a manœuvre, Alexander, with part of his troops, and his formidable companion cavalry crossed the river in another place before he was discovered. The troops of Porus were upon this drawn up in order of battle in the plain, with a line of elephants in front; the rest of the dispositions of the Indian prince were such as showed him a master of the art of war as practised at that day in India. Unlike the timid monarch of Persia, Porus made a gallant defence; but the Macedonian cavalry, and the compact mass of the infantry bristling with their spears directed by the courage and skill of Alexander, were a force that no Indian army could resist. The whole loss of the enemy was, according to Arrian, about 23,000, while the number that fell on the side of the conqueror is stated so disproportionately small, as to lead us to doubt the accuracy of Arrian's authorities. Two sons of Porus fell in the battle; and the gallant father at last yielded to Alexander, who treated him with the respect due to his rank and courage, and restored to him his kingdom with extended limits. In this battle a number of elephants fell into the hands of the Greeks; and from this time we may date the use of that animal in European warfare.

We are told that Alexander founded two cities, or probably military posts, one on each bank of the Hydaspes. One city was called Nicæa, to commemorate his victory; the other Bucephala, in honour of Alexander's horse Bucephalus, which, after carrying his rider safe through so many battles, died in the last encounter, worn out by old age and fatigue.

From the Hydaspes the army advanced to the great Acesines or *Chin-ab*, which Ptolemy describes as fifteen stadia, or considerably above a mile in breadth. This estimate, which may be true of some parts in the rainy season, when Alexander crossed it, far exceeds the ordinary limits of the river. It was crossed in boats, and on skins; the latter mode, which is still common on the Chin-ab, was found the safer conveyance. The country between the Chin-ab and the Hydraotes, (Ravee, or Iraoty,) to which Alexander was now advancing, is said to be a sheet of hard clay without a blade of grass, except on the banks of the rivers. Over this tract he marched and crossed the Hydraotes to attack a new enemy. A second Porus, who was king of the country between the Acesines and Hydraotes, had fled as the enemy approached, and hence received the name of Coward. The recurrence of the name Porus, added to other reasons, proves that this was not a proper name of an individual, but of a family or tribe. The dominions of the runaway Porus were given to the true man. But all the Indians east of the Hydraotes were not cowards: the Cathæi, a warlike tribe, were determined to oppose the invader. Three days' march brought the Greeks to Sangala, where the Cathæi were stationed on an eminence with a triple line of waggons around it. Such mounds or eminences, surrounded by a brick wall higher on the outside than the inside, are found in the Penj-âb. The city was captured with the usual slaughter, and the power of the brave Cathæi was for the time broken. A pastoral tribe, a robust and manly race, bearing the name of Kattia or Jun, still exists in the countries between the Chin-ab and the Ravee, and is conjectured by a late explorer of those regions (Burnes) to be the Cathæi of Arrian. The name and the locality are certainly in favour of this hypothesis. The king was still eager to press forward beyond the Hyphasis, a river which under the name of Garra joins the Chin-ab (29° 30′ N. lat.,) and is formed of the united streams of the Sutledge and the Beeah. The latter name is a contraction of Bypasa, which retains some traces of the Greek name Hyphasis. Report magnified the wealth of the countries east of the Hyphasis, and the adventurous conqueror probably thought to make the Ganges the boundary of this progress. But his Greek troops exhausted with fatigue, disappointed in finding a country poor, and full of vigorous enemies, and seeing themselves now only a handful of strangers in a foreign land, could not be induced either by threats or persuasions to cross this river. The Hyphasis was, therefore, the boundary of Alexander's conquests and of that victorious progress, to which no other history offers a parallel. The Macedonians, a race hitherto looked on with contempt by many of the southern Greeks, furnished the officers for this bold undertaking; the Republics, whose names and exploits form the subject of all previous Grecian history, had no representative in the glories of the Indian conquest. It appears further when we consider the small number of Macedonians, Thessalians, and soldiers from southern Greece who formed the original army, or were afterwards added to it, that Alexander's army must have been constantly recruited from the nations among whom he came, and must have presented at this period a strange and motley aspect of Asiatic and European troops officered by Macedonians.

Our limits compel us to pass briefly over the remaining events of Alexander's life. The army retraced its steps to the Hydaspes, where a fleet was constructed of the timber which this river still abundantly supplies from the upper parts of its course. On descending the river to its confluence with the Acesines, the fleet experienced, at the junction of these streams, the dangerous rapids which are said only to exist in July and August. The long ships of war suffered severely, but the 'round boats,' as Arrian calls them, which probably resembled the native boats still used on the river, passed the dangerous spot in safety. A late traveller (Burnes) finds but a faint resemblance between the description of Arrian and the realities at the junction of these two great rivers. (vi. 4.)

The Malli, a powerful Indian tribe, who seem to have chiefly occupied the lower course of the Hydraotes (Ravee), were next attacked. We are inclined to look in the modern

Multan, or Malli-than, which stands on a mass of ruins, on the left bank of the Chin-ab, for the capital of the Malli which was taken by Alexander; but it is impossible to reconcile the description of Arrian, which is certainly very vague, with the position of Multan. We can hardly doubt, however, that Multan is on the site of one of the conquered cities. In this campaign, Alexander, like some of the modern heroes of the Penj-âb, swam across the Ravee, at the head of his cavalry, to attack the enemy, who were drawn up on the opposite bank.

The Oxydracæ, who were also obliged to surrender, may possibly have their name preserved in the name of Ouch, a town with a considerable population on the left bank of the Chin-ab, five miles below the junction of the Garra, which takes place in 29° 30′ N. lat.

The troops moved downwards (B.C. 325) to the confluence of the Indus and the Chin-ab at Mittun (28° 55′ N. lat.), where Alexander gave orders to found a city at the confluence of the two mighty streams, and to build dock-yards. Here he left Philip as satrap, with all the Thracians that belonged to the army, and a sufficient number of soldiers of the line to ensure the military occupation of the country. With his fleet increased, Alexander sailed down the Indus, placing Craterus and the elephants on the east bank, with orders to advance. He visited, in his voyage downwards, the royal city of the Sogdi, doubtless a corrupted name, and established there a dock-yard. Musicanus, an Indian prince, who lived lower down the stream, surrendered, and his city received a foreign garrison. Oxycanus, another prince, resisted, but in vain: his two chief cities were taken, and himself made a prisoner. The next acquisition was Sindomana, the capital of Sambus, which is probably the modern Sehwan (26° 22′ N. lat.), where there is a large mound sixty feet in height, surrounded by a wall of burnt brick, and which now encloses only a heap of ruins. Musicanus, in the mean time, revolted,—induced by the Brachmans, that is, the ruling caste. His second career was, however, short: he was caught and hanged, together with the leaders of the movement.

The narrative of Arrian is here obscure and corrupt (compare vi. 15, 9, and 17, 6): it appears, however, that part of the army was sent from the banks of the Indus by land, towards the country of the Arachoti and Drangæ (through Candahar), by a route now well known to exist; from Candahar they were ordered to proceed to Carmania. The fact of this line of road being known to Alexander, is a confirmation of his having been on the site of Candahar before he entered India, and it also adds to the probability of this being the Alexandria above alluded to. Shikarpoor on the Indus must be about the point of departure.

At Pattala (Tatta?), the apex of the great delta of the Indus, and about sixty-five miles from the sea, Alexander established a naval station, and laid the foundation of a city, which he no doubt anticipated would prove the centre of an extended commerce; and such it might be in the hands of a politic and powerful governor. The enterprising monarch himself explored the two great arms that embrace the delta of the Indus. In the western, called the Buggaur, he experienced the dangers of this rapid and destructive stream, swollen to increased fury by a strong wind from the sea; while the rapid ebb and flow of the tides, which at full moon rise about nine feet, left his boats suddenly on dry land, and as suddenly returned to surprise them. At last he reached the mouth of the stream, and beheld the great Indian Ocean: he floated onwards till he was fairly in the open sea, with the view of ascertaining, as he said, if he could spy any land. His historian conjectures that he wished to be able to say that he had navigated the Indian Ocean. He next explored the eastern branch, which he found more practicable, and opening into a wide æstuary. It may be doubted whether he sailed down the Sata, or present eastern arm of the Delta. It is possible that he navigated the Koree, which has the widest embouchure of all, though now no longer an outlet of the Indus. Alexander appears to have had views somewhat beyond those of an ordinary commander: he evidently possessed a spirit of geographical discovery.—'With a few horsemen,' says Arrian, 'he followed the outline of the Delta along the margin of the ocean, to see what kind of a country it was, and he ordered wells to be dug for the benefit of those who might navigate this coast.' He also established a naval station on the wide æstuary, and left a garrison to keep the country in order.

Nearchus, the commander of Alexander's fleet, received orders to set out on his voyage along the coast towards the Persian gulf, as soon as the change of the monsoons would allow him. The narrative of this voyage, the earliest of which any account is extant, will be given under the head of NEARCHUS. Alexander himself set out from Pattala with his army somewhat earlier, about September, B.C. 325. The route from the Delta of the Indus to Bunder Abbas (Gombroon) on the shore of the Persian Gulf is practicable for elephants, and also for an army when attended by a fleet with supplies. This line differs very little from that which Alexander would follow in his sixty days' march from the western limits of the Oritæ to Pura (Fureg?) Scarcity of water drove the army on one occasion to seek it by digging on the sandy beach of the ocean, the coast of which they followed for seven days. But the sufferings of the soldiers in this arid desert, if we follow the accounts of Arrian and Strabo, were almost beyond description, owing, perhaps, as much to the want of supplies for so large a number of men, as to the barrenness of the country itself. We have no doubt that the difficulties of this desert were exaggerated by the Alexdrine historians. The sufferings of an ill-provided army in a country unable to furnish sufficient supplies, added to the exhaustions of so many campaigns, would doubtless all tend to make the inhospitable wastes of Gedrosia (Mekran) look more formidable than they really were. From Pura the army advanced without any difficulty to the capital of Karmania (the modern Kirman.) Here Alexander was joined by Craterus with the elephants, and the detachment already spoken of as sent through Candahar. The route of this commander was doubtless along the valley of the Helmund, from which the road to Kirman offers no serious difficulties. Nearchus also joined the king here, having conducted the fleet in safety to Harmozia, a place on the main land opposite the barren island of Hormuz, a name once celebrated in modern oriental warfare and commerce.

From Kirman, Hephæstion led the mass of the army, with the beasts of burden, and the elephants down to the coast, as the road along the Persian Gulf was more practicable in the winter season that was approaching. The king himself advanced with his lightest troops and the companion cavalry to Pasargadæ, (probably Murghaub,) the burial place of the great Cyrus. [See CYRUS. PASARGADÆ.] He found the tomb rifled by some robbers, who cared not for the honour of the great national hero who for more than 200 years had slept undisturbed. The golden coffin that contained the embalmed body of the monarch was the object of the plunderers, but after taking off the lid and throwing the corpse from its resting-place, they were unable to carry off the booty on account of its weight. Alexander ordered the mutilated body to be restored to the tomb, and Aristobulus tells us he himself received the king's commands to repair the damage that had been done, and secure the remains of the great Persian warrior from any similar insult.

From Pasargadæ, Alexander came to Persepolis, the city which he is said to have burnt at his former visit. If we may trust Arrian, the sight of the mischief he had done gave him no satisfaction. Here he named Peucestas, a Macedonian, satrap or governor of the province of Persis, in the place of the Persian governor who was hanged for his mal-administration. Peucestas forthwith followed a course of policy which Alexander well knew how to appreciate. He adopted the dress and usages of the country, and made himself a perfect master of the Persian language: the Persians, as we are informed by the historian, were naturally pleased with him. His example, to a certain extent, may serve as a pattern to modern nations who occupy a foreign land.

At Susa, on the banks of the Ulai, or Choaspes, (B.C. 324,) the army at last rested from their labours, and the interval of leisure was employed in enjoying the festivities of marriage. Alexander himself took another wife, Barsine, the eldest daughter of Darius; if we may trust Aristobulus, he married also at the same time Parysatis, the daughter of Ochus, thus sharing the honours of his Bactrian wife Roxana with two of Persian stock. Eighty of his chief officers, at the same time, received each an Asiatic wife from their royal master, who seems to have assigned the women to their respective husbands just as he would have parcelled out so many governments. Hephæstion married a daughter of Darius, it being Alexander's wish that his and his friend's children should be related by blood. The wives of Craterus, Perdiccas, Ptolemy, the future king of Egypt, Eumenes, Nearchus, and Seleucus, are specially mentioned by the historian.

'The marriages,' he adds, 'were celebrated after the Persian fashion: seats were placed for the bridegrooms, and after the wine, the brides were introduced, and each sat down by her husband. The men took the females by the hand and kissed them, the king setting the example. Alexander gave a dowry with each. Every other Macedonian who chose to take an Asiatic wife was registered, and received a present on his marriage; the number who followed the king's example was above 10,000. The feastings and revelry that attended the marriage celebration were diversified by every kind of amusement that music, theatrical representations, and all the talents of the most skilful *artistes* of the Greek nation could supply; but in the midst of this scene of perhaps riotous festivity, we must not overlook the wise policy of Alexander, by which he endeavoured to blend the conquerors and the conquered into one nation by the strong ties of inter-marriage. It was obviously, also, a further design of Alexander, as we see from his historian, to train the natives of Asia to European arms and manœuvres, and by incorporating them with his troops, and forming also new bodies, to render himself independent of the control of his Macedonians.

Discovery and works of utility also still engaged his attention. He sailed down the Karoon (Arrian vii. 7, says the Eulæus) into the gulf, examined part of the Delta of these rivers, and ascending the Shat el Arab, went up the Tigris as far as Opis. In this voyage he removed several of those large masses of masonry, commonly called *bunds*, which were built across the river for the purpose of making a head of water and favouring irrigation; but they proved at the same time an impediment to the navigation, which it was the conqueror's policy to improve and extend. Various remains of such constructions exist at the present day in the rivers of Susiana.

Having quelled a rising mutiny among his Macedonians, and dismissed the worn-out veterans with more than their full pay, he went, about the close of the year B.C. 324, to Ecbatana, the northern capital of the empire, where Hephæstion his favourite died. The grief of Alexander, which was no doubt sincere, displayed itself in all the outward circumstances of sorrow, but from the mass of contradictory accounts, Arrian (vii. 14) found no little trouble in extracting a probable and a rational narrative. On his route towards Babylon from Ecbatana, (Hamadan,) Alexander diverted his grief by subduing the Cossæi, a mountain tribe of robbers, whom he entirely rooted out, as he thought; but they soon showed themselves again. It seems as if the temperament of Alexander required a feverish excitement, and that rest and inactivity would have proved more fatal to his existence than the most incessant toil. Neither the severity of winter, nor the difficulties of the country proved any obstacle 'to Alexander and Ptolemy, the son of Lagus, who commanded part of the army.' On his approach to the ancient city of Babylon, he was met by embassies from nearly every part of the known world, who had come to pay their respects to the new lord of Asia—from Carthage, from southern Italy, from Europe north of the Black Sea: Celts and Iberians too, it is said, paid their homage in this motley assemblage.

The priests of the temple of Belus endeavoured to persuade the king that he could not safely enter the city: the great Belus himself had given this warning. Their motives, as Arrian tells us, and as we might readily suspect, were not so disinterested as they appeared. The great temple was in ruins, and the priests had made little progress in rebuilding it according to the orders given during Alexander's first visit (Arrian iii. 16): they enjoyed, however, its ample revenues, which, like prudent economists, they had no wish to expend on a useless building. The king despised the warning of Belus and his priests, and entered the city.

In Babylon Alexander proposed to fix the seat of his empire, and to live in a style of splendor unknown even to the monarchs of the East. His projects were grand and characteristic. He sent Heraclides to build vessels on the Caspian, and to explore these unknown waters, which Herodotus a century before had declared to be an inland sea, but other opinions connected with the Euxine, or the Great Ocean. He excavated a basin at Babylon to hold the vessel that should navigate the Persian gulf and the Euphrates, while he spared no pains to induce skilful seamen to repair to his new capital. The circumnavigation of the Arabian peninsula, and the subjection of its predatory hordes, were also part of his plan, but no commander of those who were sent out ventured farther than Cape Maketa (Cape Mussendom) at the entrance of the gulf. The improvement of the agriculture of the fertile Babylonian plains was another object of his policy; as a preliminary to which the numerous canals for irrigation required repair, and the great drain from the river during the season of the floods, the Pallacopas (see EUPHRATES, PALLACOPAS), was rendered more efficient. These fertile regions still retain the traces of the ancient Babylonian culture in their canals, embankments, and other contrivances for irrigation; but they wait for the presence of a wise and powerful government to secure to the labourer the produce of his industry, and to rouse him by example to attain the happiness which nature is ready to bestow.

In the midst of these undertakings, and the preparation for his Arabian expedition, Alexander died. The immediate cause of his death was a fever, probably contracted while superintending the work in the marshes round Babylon, and aggravated by a recent debauch. The daily bulletins during his illness may be seen in Arrian (vii. 25): he seems to have had no physician. This is nearly all that can with certainty be said about the circumstances of his death. He died at the early age of thirty-two years and eight months, after a reign of twelve years and eight months; during nearly the whole of which time, his sword was actively employed in diminishing the numbers of the human race. Arrian (vii. 28) has pronounced his perhaps too partial panegyric, the truth of which, however, no one should dispute till he has carefully weighed the whole evidence. 'Whoever,' says the historian in conclusion, 'vilifies Alexander, should not allege merely those events of his life which merit blame, but should collect *all* the facts of his life and then consider, first, who he is himself, and what has been his own fortune; and then, who Alexander was, and how great was *his* fortune: he should consider that Alexander was the undoubted monarch of two continents, and spread his name over the whole earth; and especially should the vilifier of Alexander bear this in mind, if he is himself a person of little importance, engaged in matters also of little importance, and not managing even these well. I think there was no nation, nor city, nor individual of that day, who had not heard of Alexander's name. It is my opinion, then, that such a man, who was like no other mortal, would never have been born without a special providence.'

Alexander is said to have had a handsome person. He died without leaving any undisputed successor, or any distinct declaration of his will. His wife Roxana was with child at the time of his death.

His body was embalmed probably after the manner in use among the Persians, and finally deposited at Alexandria in Egypt, though all the circumstances attending its transport are exceedingly contradictory and uncertain. A sarcophagus in the British Museum, brought from the church of St. Athanasius at Alexandria, (No. 6 in the catalogue,) has been named without any reason the Sarcophagus of Alexander.

In this imperfect sketch many events are omitted which it is impossible to crowd into a limited space, and many parts of the narrative thus become obscure and perhaps incorrect. The following authorities may be consulted for more minute particulars, and by those who take pleasure in reconciling contradictions: Arrian's *Anabasis*. Strabo. Quintus Curtius. Plutarch's *Life of Alexander*. Diodorus, Book 17. Justin. These are the chief, but not the only antient authorities. The reader may also consult *Examen Critique des Anciens Historiens d'Alexandre le Grand*. Mitford's *Greece*. Williams' *Life of Alexander*. Burnes' *Memoir on the Indus*. *Journal of the Lond. Geog. Soc.* 1833. Lassen's *Pentapotamia Indica*.

To comprehend the political events that followed the death of Alexander, the reader may turn to the articles ANTIGONUS, ANTIPATER, DEMETRIUS, EUMENES, LYSIMACHUS, PERDICCAS, PTOLEMY, SELEUCUS; and also for other parts of his life, but briefly treated here, to ALEXANDRIA, AMMONIUM, ARISTOTLE, BABYLON, ECBATANA, EUPHRATES, INDUS, SUSA, PASAGARDÆ, PERSEPOLIS, NEARCHUS, PARMENION.

ALEXANDER I., son of Amyntas I., said to be the tenth king of Macedon, was alive at the time of the great Persian invasion of Greece, B.C. 480. His history, as far as it is known, and his share in the troubles of the Persian wars, are contained in the last five books of Herodotus.

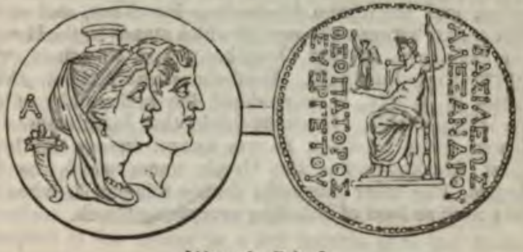
ALEXANDER II., the sixteenth king of Macedonia, was the son of Amyntas II., and ascended the throne about B.C. 370.

[Alexander Balas.]

ALEXANDER I., surnamed **BALAS**, or Βαλλης, reigned as king of Syria from 150 to 145 B.C. According to some authorities, Alexander took his surname from his mother Bala, or Balle. The following is the account given of the origin of this adventurer. His predecessor, Demetrius I., occasioned by his bad government a rebellion, which was supported by the kings of Egypt, Cappadocia, and Pergamus. The governor of Babylon, Heraclides, being exiled to Rhodes by Demetrius, induced a certain Alexander Balas, of low birth, to feign himself a son of Antiochus Epiphanes, and to claim as such the right of succeeding him. The Roman senate acknowledged this pretender on his appearing at Rome, in order to revenge themselves on Demetrius I. Polybius, who was at that time at Rome, states that the whole city was surprised at the edict, by which the senate recommended the cause of the adventurer Balas to the support of the confederate nations. This edict had, however, the effect, that Ariarathes, king of Cappadocia, Ptolemy, and Attalus II., king of Pergamus, sent troops to Alexander Balas to assist him after his return from Rome against Demetrius. Many discontented Syrians joined this army. This civil war in Syria relieved the Maccabees, who were almost subdued before this diversion took place. Demetrius I., as well as Alexander Balas, endeavoured to obtain the support of Jonathan, the Maccabee, who headed at that time the Jewish patriots. Jonathan embraced the party of Alexander Balas, who conferred upon him the high priesthood, styled him friend of the king, and presented him with a purple robe and a diadem. Alexander Balas having been defeated in the first battle, 152 B.C., received reinforcements and gained a decisive victory in the year 150. Demetrius I., who was wounded by an arrow, perished in a swamp. Alexander Balas then mounted the throne of Syria, and married at Ptolemais, Cleopatra, a daughter of Ptolemæus Philometor. On this occasion Jonathan, the Maccabee, was treated with great distinction by Alexander and Ptolemæus, was again presented with a purple robe, and appointed commander, or Meridarch of Judæa. When Balas considered his government sufficiently established, he left the cares of administration to his favourite Ammonius, in order to enjoy without restraint a luxurious life. Ammonius put to death those members of the royal family of the Seleucidæ whom he could get into his power, but there still lived in the island of Cnidus two sons of the last king, the elder of whom, Demetrius II., landed in Cilicia, whilst the governor of Cœlesyria, Apollonius, rebelled against Balas in the year 148 B.C. Apollonius was beaten by Jonathan, but Balas himself was obliged to march against Demetrius II. Ptolemy, who had apparently come to assist his son-in-law, suddenly embraced the cause of Demetrius, after accusing Balas of an intention to murder him. Balas, being defeated by Ptolemy, escaped into Arabia, where he was murdered by an Arabian chieftain contrary to the laws of hospitality, in the town of Abas, which was afterwards called *Motho*, (*his death.*) Demetrius II., surnamed Niketor, then ascended the throne of Syria.

The Emir who cut off the head of Balas and sent it to Ptolemy, is called by Josephus *Zabel*, and in Maccab. xi. 16, 17, *Zabdiel.* Diodorus Siculus (in Excerpt. Photii, cod. 244) calls him *Diocles.* Perhaps he had adopted a Greek name, like other Orientals of his time, and like the Jews of our days, who often adopt English names after their arrival in England, changing *Hirsch* into *Harris, Aaronsohn* into *Harrison, Levi* into *Lyons*, &c.

Justin (xxxv. 12) states, that Balas was the original name by which Alexander was known during the period of his private life. He is called by Strabo *Balas Alexandros*; where the word *Balas* appears to be used by him as synonymous with king. In the British Museum there are *forty-seven* silver and copper coins of Alexander Balas. On some coins he is called Θεοπατωρ (because his pretended father, *Antiochus*, had called himself Θεος, God) Ευεργετης, (see 1 Maccab. x. 1,) and Νικηφορος. These two last surnames he likewise adopted from his pretended father. On some coins the head of Alexander Balas is associated with that of Cleopatra, who occupies the foreground with a modius on her head,—an indication of his subordination to this proud woman. Handel wrote an Oratorio entitled Alexander Balas. (Fröhlich, *Annales Syriæ, Nummis Illustr.* tab. viii., ix. p. 61; Eckhel, Doctr., *Numm. Vet.* tab. iii. p. 227; Athenæus, v. c. 10; Polyb. *de Legat.* c. 140; Appian, *Syr.* c. 31; Diod. Sic. *Fragm.* xxxii.; Joseph. *Archæol.* xiii. 2; 1 Macc. x. 11; Gesenius in *Ersch und Gruber; Seleucidarum Imperium sive Hist. regum Syriæ ad fidem numismatum accommodata per Foy-Vaillant.*)



[Alexander Balas.]

[Alexander Jannæus.]

ALEXANDER JANNÆUS, third son of Johannes Hyrcanus, succeeded his brother Aristobulus as king of the Jews and as high-priest, from B.C. 106 or 104 to 79. Following the example of his brother, he turned the disturbances in Syria to his own profit. He attacked Ptolemais, (the present Acre,) which, like other cities, had made itself independent. The inhabitants called Ptolemæus Lathyrus, of Cyprus, to their assistance, by whom Alexander Jannæus was beaten on the banks of the Jordan, and Palestine horribly ravaged, until, by the aid of Cleopatra, the mother of Lathyrus, Alexander was enabled to repel his enemy. Alexander then conquered Gaza, burned the city, and massacred the inhabitants who had joined the party of Lathyrus; but not without losing many of his own soldiers. Jannæus embraced the party of the Sadducees; and, of course, was hated by the Pharisees and by the people. On the Feast of Tabernacles, after being pelted by the people with lemons, and loudly insulted by their opprobrious language, he caused 6000 men to be cut down, and in future protected himself by a body guard of Libyans and Pisidians. Having lost his army in an unfortunate expedition against the Arabians, the Pharisees made an insurrection, and carried on for six years a civil war against the king, in which 50,000 Jews are said to have perished. The rebels, supported by the Arabians, the Moabites, and by Demetrius Eukæros, compelled Alexander to escape into the mountains. But a part of the auxiliaries coming over to the king's party, he was now enabled to crush the rebels, and to gratify his vengeance by crucifying, on one day, 800 of the most distinguished captives: their wives and children were massacred before their eyes; whilst the king dined with his wives in sight of the executed rebels. On account of this cruelty he was surnamed the *Thracian.*

Having intimidated his enemies, and restored public peace, he engaged in several successful wars, by which he enlarged his dominions. Being desirous to reconcile his subjects, he asked them what he should do in order to make them quite content? '*Die*,' they replied. He did die at the siege of Regaba, or Ragaba, in the territory of Gerasene beyond the Jordan, in consequence of his gluttony, in the twenty-seventh year of his reign. He had two sons; but left the government to his widow. Before his death, he advised his wife Alexandra to conciliate the Pharisees, by whom he was buried in a pompous style. His reign, like the rest of the later history of the Jews, is full of cruelty and acts of perfidy, although, in comparison with others, he has obtained the praise of moderation. (Joseph. *Archæolog.*, xiii. c.12-15.) There is a small copper coin of Jannæus in the British Museum, but the Samaritan inscription between the rays of the stars, mentioned by others, is not discernible. (Compare Bayeri, *Vindiciæ, Num. Hebr.*, plate, fig. 5.) There is a coin extant of Alexander Jannæus, having on one side an anchor, and the legend Αλεξανδρου Βασιλεως, and on the other a star, between the rays of which stands in the Hebrew coin characters, יהונתן (Jonathan), and on others, מלך יהונתן (King Jonathan). Barthelemy and Eckhel, *Doctr. Numm.* iii. p. 479, have rendered the authenticity of this coin very probable. Gesenius thinks that Jonathan was the Hebrew name by which he was known among the Jews; whilst Alexander was the Greek name which he had adopted, like other monarchs during this period, when the Jews were so fond of imitating everything Greek.

[Alexander Zebinas.]

ALEXANDER II.—*Zebinas*, or *Zebinæus*—a pretender to the Syrian crown, reigned over a part of the kingdom of Syria, from the year 128 to 122 B.C. The inhabitants of Apamea, Antiocheia, and some other cities, disgusted with the tyranny of Demetrius II., requested Ptolemæus Physcon to appoint another king. Ptolemy sent them a young Egyptian, the son of a broker Protarchos of Alexandria, whom he represented as having been adopted by Antiochus Sidetes. The pretender took the name Alexander; but the people called him, in derision, זְבִינָא *Zebina*, that is, *the bought one*. Demetrius being defeated near Damascus, fled to Tyre, where he was murdered. Zebinas, thinking his kingdom firmly established, refused the annual tribute to Ptolemæus Physcon, who now encouraged Antiochus VIII., the son of Demetrius II. Zebinas was in his turn defeated by the Egyptian army, and retreated to Antioch; where, being unable to pay his troops, he permitted them to pillage the temple of Victory, and took for himself the golden statue of Jupiter. Expelled by the people of Antioch from their city, and deserted by his troops, he endeavoured to escape on board a small vessel into Greece, but was taken by a pirate, and delivered into the hands of Ptolemy, who put him to death. Twenty-two coins of Zebinas are to be seen in Fröhlich, *Annales Syriæ*, tab. xii. (Compare p. 84, Eckhel, *Doctr. Numm. Vet.* iii. p. 237 ; Justin, xxxix. 1, 2 ; Joseph., xiii. 9, 10 ; Athenæus, v. 17 ; Gesenius, in *Ersch und Gruber ;* Foy-Vaillant, *Syriæ Hist. ad fidem numismatum accommodata.*) The British Museum contains twenty-six silver and copper coins of Alexander Zebinas.

ALEXANDER, a son of King Aristobulus II., and grandson of Jannæus, was taken captive in Judæa by Pompey, who intended to exhibit him with his father and brother in his triumph at Rome. Alexander escaped on the journey, and returned to Judea, where he raised an army of 10,000 foot and 1500 horse to attack Hyrcanus, who had been appointed by Pompey to govern Judea. Alexander took several castles in the mountains; but Hyrcanus imploring the assistance of the Romans, Marcus Antonius, who was sent by Gabinius, governor of Syria, defeated Alexander near Jerusalem, B.C. 57, and besieged him in Alexandrion, a small town with a fine castle about six miles south of Tyre, where he capitulated. After his father Aristobulus had escaped from Rome to Judæa, and had been again defeated and put into prison, Alexander once more took up arms, conquered Judæa, put many Romans to death, and besieged the rest in Garizin. But his army of 30,000 men was finally defeated by Gabinius, in a battle near Mount Tabor, in which 10,000 Jews perished. Alexander at last fell into the hands of Metellus Scipio, and was beheaded at Antioch, in the year 49 B.C. (Joseph., *Arch.* xiv. 5, 6, 7 ; *Bell. Jud.*, i. 8, 9.) A few variations of this account occur in יוסיפון בן גוריון. (*Ed. To. Frid. Breithaupt.* lib. iv. cap. xxiv., xxv. p. 337 to 349.)

ALEXANDER SEVERUS. [See SEVERUS.]

ALEXANDER POLYHISTOR. [See POLYHISTOR.]

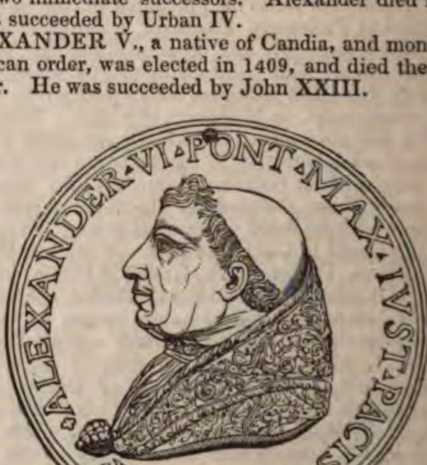
ALEXANDER I., one of the earliest bishops of Rome, succeeded Evaristus about the beginning of the second century of our æra, but the precise epoch is not well ascertained.

ALEXANDER II., a Milanese, succeeded Nicholas II. in 1061. This was at the beginning of the long dispute between the See of Rome, and the Emperors of Germany, concerning the investitures, of which cardinal Hildebrand, afterwards Gregory VII., was the chief instigator. The imperial party assembled another conclave at Basle, where they elected Cadalous, Bishop of Parma, who took the name of Honorius II. After a struggle between the two competitors, Cadalous was taken prisoner and confined in the castle of Saint Angelo at Rome, and Alexander was generally acknowledged as lawful pope. He died in 1073, and was succeeded by Gregory VII.

ALEXANDER III., Cardinal Rolando of Siena, succeeded Adrian IV. in 1159. His long pontificate of 21 years was agitated by wars against the Emperor Frederic I., and by a schism in the church, during which three successive antipopes were raised in opposition to Alexander. The latter took part with the Lombard Cities in their struggle against Frederick. [See FREDERIC BARBAROSSA.] At last peace was made, and the pope and the emperor became reconciled at an interview they had at Venice in 1177, and Alexander was universally acknowledged as legitimate pope. He held a great council in the Lateran palace in 1180, when, among other regulations, a decretal was passed, that two-thirds of the cardinals should be requisite to make an election valid. He died at Rome in 1181, and was succeeded by Lucius II. The famous Thomas à Becket was Archbishop of Canterbury during Alexander's pontificate. The latter took part with the English prelate in his contest with King Henry II., and canonized him after he had been murdered.

ALEXANDER IV., of Anagni, succeeded Innocent IV. in 1254. He inherited the ambition, but not the talents of his predecessor. He manifested the same inveterate hostility against the house of Suabia, and its representative Manfred, King of the two Sicilies, but did not succeed in his attempt at overthrowing the latter, which became the work of his two immediate successors. Alexander died in 1261, and was succeeded by Urban IV.

ALEXANDER V., a native of Candia, and monk of the Franciscan order, was elected in 1409, and died the following year. He was succeeded by John XXIII.



[Alexander VI.]

ALEXANDER VI. Roderic Borgia of Valencia in Spain, a man of great personal wealth and of some ability, but of loose conduct. He had been made a cardinal by his uncle Calixtus III., and was elected pope in 1492, after the death of Innocent VIII. At the time of his election, he had four children by his mistress Vanozia; and (during his reign) he made no scruple at employing every means in his power to confer on them honour and riches. The most notorious of his sons was Cesar, first cardinal, and afterwards made Duke of Valentinois in Dauphiny by King Louis XII, from which he was styled the Duke Valentine, a name which he rendered infamous by his atrocities. The politics of the pope were capricious and faithless in the extreme. At first he was hostile to the house of Aragon then reigning at Naples, and showed himself favourable to the French who were at that time attempting to invade Italy, but afterwards his younger son, Gioffredo, having married a daughter of Alfonso II. of Naples, Alexander allied himself with the latter, for the purpose of arresting the progress of the invaders. As, however, Charles VIII., at the head of his army, advanced upon Rome, the pope received him with honour, and promised him his support for the conquest of Naples, and even gave him his son, Cardinal Cesar, as a hostage. But the Cardinal found means to escape; and Alexander joined the league formed in the North by the Venetians and Sforza against the French, which led to the expulsion of the latter. He afterwards allied himself to Lewis XII. of France, successor of Charles VIII., who wanted the Pope's sanction for divorcing his first wife: he was also a party to the double treachery by which Ferdinand of Spain first betrayed the cause of his relative, Frederic of Naples, partitioning that kingdom between Lewis XII. and himself; and then, breaking his engagement with the French, he seized upon the whole of the conquest by means of his general, Gonsalvo. Alexander's internal policy was, if possible, still more perfidious. He was bent upon the destruction of the great Roman families of Colonna, Orsini, and Savelli; and either by treachery or open violence he in great measure succeeded in putting to death most of them, and seizing on their extensive possessions. He sent his son, the Duke Valentine, into the Romagna, where, by means of similar practices, the latter made himself master of that country, entrapping and strangling the independent lords and petty despots of the various towns. Alexander gave his only daughter Lucretia Borgia in marriage, first, to Giovanni Sforza, Lord of Pesaro, whom she afterwards divorced; then to a prince of the house of Aragon, who was murdered by her brother Cesar; after which she lived some time in the pontifical palace, sharing in the intrigues and licentiousness of that court. She was married a third time, in 1501, to Alfonso d'Este, son of Hercules Duke of Ferrara, to whom she brought as a dowry 100,000 golden pistoles, besides jewels. Alexander's eldest son, John Duke of Gandia, was murdered one night while returning from a debauch, by unknown assassins, and thrown into the Tiber. (See Roscoe's *Leo X.*, vol. i.) At last Alexander himself died on the 18th of August, 1503, being seventy-four years of age. It was said, and several historians have repeated the assertion, that he died of poison which was intended for his guest, the Cardinal of Corneto. This crime, however, is not clearly proved; and the Pope having been ailing for some time with a tertian fever, this circumstance, added to his advanced age and irregular habits, is sufficient to account for his death. He was succeeded nominally by Pius III., who died twenty-six days after his election, and then by the famous Julius II. The pontificate of Alexander VI. is certainly the blackest page in the history of modern Rome. The general demoralization of that period, of which abundant details are found in John Burchard's *Diarium*, as well as in Panvinius, Muratori, Fabre's continuation of Fleury's *Ecclesiastical History*, and other writers, Catholic as well as Protestant, appears in our times almost incredible.

ALEXANDER VII., Fabio Chigi of Siena, succeeded Innocent X. in 1655. He embellished Rome, protected learning, but was accused of favouring too much his relatives and connexions. He was embroiled in a dispute with the imperious Louis XIV. of France, in consequence of some insult which had been offered by the populace to the Duke of Crequi, French ambassador at Rome. He died in May, 1667, and was succeeded by Clement IX.

ALEXANDER VIII., Cardinal Ottoboni of Venice, succeeded Innocent XI. in 1689. He assisted his native country in its wars against the Turks. He died in February, 1691, at the age of eighty-two, and was succeeded by Innocent XII.

ALEXANDER I., king of Scotland, was a younger son of Malcolm III. (Canmore), and succeeded his eldest brother Edgar, who died without issue on the 8th of January, 1107. In those times, in Scotland, as well as in other countries, the succession to the throne was frequently regulated, at least to a certain extent, by the will of the reigning king; and Edgar, at his death, left part of his dominions to his younger brother David. Lord Hailes thinks that David's share was only the Scottish portion of Cumberland; but it appears rather to have included the whole territory that was considered subject to the Scottish crown to the south of the Forth, except the Lothians. Alexander was at first inclined to resist this apportionment; but he eventually acquiesced in it. The instructions of his mother, Margaret, the sister of Edgar Atheling, and the advantages which he enjoyed from the society of the English exiles, who crowded, after the Conquest, to his father's court, had given to Alexander a degree of literary cultivation which none of his predecessors had possessed. His natural talents seem also to have been of a superior order; while he possessed, in an eminent degree, the energy of character suited to the government of the rude and turbulent country which Scotland then was. His reign, almost from its commencement, was agitated by successive insurrections; every one of which, however, he promptly put down. One of the most serious was that excited in the district of Moray, in 1120, by Angus, the grandson of Lulach, son of the wife of Macbeth, and the occupant of the throne for a few months after the death of that usurper. Angus claimed the crown in virtue of this descent; but the attempt was met by Alexander with his usual decision, and speedily quelled. From the energy which he displayed on this occasion, he derived the epithet, or surname, by which he is known in Scottish history. The old chronicler, Wynton, says,

> 'Fra that day forth his lieges all
> Used him Alexander the Fierce to call.'

Alexander showed equal spirit in resisting all foreign encroachments upon the independence of his kingdom. The annals of Scotland during his reign are chiefly occupied with the disputes occasioned by the pretensions of the Archbishops of Canterbury and York to episcopal jurisdiction over that country. A very full abstract of the course of this controversy has been given by Lord Hailes; but it is sufficient here to state, that the determination of the Scottish king at length compelled the English prelates to give up the contest. St. Andrew's, and several of the other ecclesiastical foundations of Scotland, were largely indebted to the bounty of Alexander. The only church of which he was the founder, however, was, we believe, that which he built in 1123 on the isle of Inchcolm, in the Frith of Forth, in the neighbourhood of which he had nearly perished in a tempest. He died at Stirling, without leaving any legitimate issue, on the 27th of April, 1124, and was succeeded by his brother David I. Alexander had married Sibilla, the natural daughter of Henry I. of England. She died suddenly, at Lochtay, on the 12th of June, 1122.

ALEXANDER II., king of Scotland, was born at Haddington, on the 24th of August (St. Bartholomew's day), 1198, and succeeded his father, William the Lion, on the 4th of December, 1214, being crowned at Scone on the following day. His mother was Ermengarde, daughter of Richard Viscount of Beaumont, and granddaughter of a natural daughter of Henry I. of England. He began his reign by entering into a league with the English barons who were confederated against King John,—engaging to aid them in their insurrection, on condition of being put in possession of the northern counties of England. This led to several devastating incursions into each other's dominions by the two kings. The death of John, in October, 1216, put an end to their hostilities; and the following year Alexander concluded a treaty of peace with the new sovereign of England, Henry III., one of the conditions being that Alexander should espouse Henry's eldest sister, the Princess Joan. This marriage accordingly took place on the 25th of June, 1221. In the course of the following thirteen or fourteen years, Scotland was disturbed by insurrections which broke out successively in Argyle, in Caithness, in Murray, and in Galloway; all of which, however, Alexander succeeded in repressing. Meanwhile the connexion which he had formed with the royal family of England preserved peace between the two countries, and even led to considerable intercourse between the Scottish king and his brother-in-law, whom he repeatedly visited at London. The death of Queen Joan, however, without issue, on the 4th of March, 1238, and the marriage of Alexander, on the 15th of May in the following year, with Mary, daughter of a French nobleman, Ingelram de Couci, broke this bond of amity; and after some years of mutual dissatisfaction and complaint, the two kings prepared to decide their differences by arms in 1244. By the intervention, however, of some of the English nobility, bloodshed was prevented, after Alexander had approached the border with an army, it is said, of 100,000 men; and a peace was concluded at Newcastle in August of that year. In 1247, another insurrection broke out in Galloway, which Alexander soon succeeded in putting down. In the summer of 1249, he had set out at the head of an army to repress a rebellion raised by Angus, Lord of Argyle, when he was taken ill at a small island, variously spelled Erray, Kerreray, Kerarry, or Kirarry, off the coast of Argyle, and died there on the 8th of July. By his second marriage, he left an only son, his successor, Alexander III., born at Roxburgh on the 4th of September, 1241. Alexander II. bears a high character in the pages of the ancient historians and chroniclers of Scotland; and he appears to have been a prince endowed with many great qualities. Besides the warlike ability with which he preserved both the independence and the internal order of his kingdom, he is particularly celebrated for his regard to justice, and the wisdom and impartiality with which he took care that the law should be administered among all classes of his subjects. This is a virtue in a king, or governor, that never fails to attract the popular attachment and respect; and, accordingly, we are told by a contemporary English writer, Matthew Paris, that Alexander was deservedly beloved, not only by his own subjects, but by the people of England likewise. He is usually characterised as altogether one of the ablest and best of the Scottish kings.

ALEXANDER III., King of Scotland, was the son and successor of Alexander II. Although only eight years old at his father's death, he was crowned at Scone, by David de Berneham, Bishop of St. Andrew's, on the 13th of July, 1249, having previous to that ceremony been knighted by the same ecclesiastic. He had, already, when only a year old, been betrothed to Margaret, the eldest daughter of the English king, Henry III.; and notwithstanding the youth of both parties, the celebration of the marriage took place at York, on the 25th of December, 1251. The connection thus formed, together with the minority of his son-in-law, gave Henry a plausible pretext for interfering, as he was very anxious to do, in the affairs of Scotland; and the distracted state of that kingdom, occasioned by the factions among the nobility, facilitated his views. In August, 1255, he approached the borders at the head of an army; and, the Castle of Edinburgh, in which the king and queen resided, having been previously taken by surprise out of the hands of the Comyns, in whom the regency of the kingdom was then vested, that party, comprising the most patriotic portion of the nobility and clergy, was dismissed from power, and the administration committed to their opponents. This arrangement, although made ostensibly in concert with the young king, may be considered as having been dictated by Henry, and as having had for its principal object the establishment of the supremacy of England. It was the commencement of the design so perseveringly pursued by Henry and his successor, to reduce the Scottish kings to the condition of vassals. The eminent talents, however, which Alexander began to display as soon as he came of age, and took the administration of affairs into his own hands, together with the determination he showed to maintain his own rights and the independence of his dominions, effectually thwarted the further prosecution of these views so long as he lived. Meanwhile he kept on good terms with his father-in-law. In 1260, he visited London with his queen; and in February, 1261, the latter was delivered at Windsor of a daughter, who was named Margaret.

Alexander had not long assumed the government, when he was called upon to meet a foreign power, which aimed at the conquest of the kingdom. On the 1st of October, 1264, Haco, king of Norway, after having ravaged the western islands in the course of the summer, approached the coast of Ayrshire at the head of a numerous fleet. Every preparation had been made by the Scottish king to meet this formidable armament; but he found after all his best aid in the elements. When only a small portion of the Norwegian troops had landed, a tempest of unusual fury suddenly arose, and drove nearly all the ships on shore or otherwise destroyed them. The attack of the Scottish soldiers and peasantry completed the destruction of the invading force; and Haco with difficulty made his escape, only to die of a broken heart a few months afterwards. Next year Magnus, Haco's successor, agreed to relinquish to the king of Scotland the Hebrides and the Isle of Man for the sum of 4000 marks, and a small yearly quit-rent. In 1282, the peace between the two kingdoms was further consolidated by the marriage of Alexander's daughter, Margaret, to the Norwegian king Eric, then a youth of fourteen. Margaret died in 1283, but left a daughter of the same name, commonly designated the Maiden of Norway, who eventually became the successor of her grandfather on the Scottish throne.

The successful resistance which, seconded by his clergy, he offered to an attempt of the pope to levy certain new imposts in his dominions, is almost the only other act of Alexander's reign which history has commemorated. Under his sway, Scotland appears to have enjoyed a tranquillity to which she had long been a stranger, and which she did not regain for many years after his decease. The death of his daughter Margaret, however, was the first of a succession of calamities. Soon after her nuptials, Alexander, the Prince of Scotland, the king's only son, who was born in 1263, had been united in marriage to Margaret, daughter of Guy, Earl of Flanders; but he also died without issue on the 28th of January, 1284. On the 15th of April, 1285, the king, having sometime before lost his first wife, took for a second, Joletta, daughter of the Count de Dreux, in the hope of leaving a male heir. But on the 16th of March, 1286, as he was riding in a dark night between Burntisland and Kinghorn, on the banks of the Frith of Forth in Fifeshire, he was thrown with his horse over a precipice, and killed on the spot. The place, which is called the King's Wood End, is still pointed out. The death of Alexander, followed as it was in a few years by that of the Maiden of Norway, was one of the most unfortunate events that ever befel Scotland, which it left to contend at once with the internal distractions arising from a disputed succession, and with all the art and force employed by a powerful neighbour to effect its subjugation. But Alexander was not less lamented by his subjects on account of his own wisdom and virtues. The country had never before enjoyed such prosperity, and Scotland may be said, during this reign, to have passed from semi-barbarism to civilization. It was under Alexander that its intercourse with England first became considerable, and that it began to acquire an acquaintance with the arts and manners of what we may call European life. This king also improved and completed the system for the dispensation of justice which had been introduced by his father; he divided the country into four districts for that purpose, and made an annual progress through it in person for hearing appeals from the decisions of the ordinary judges. He was long affectionately remembered in Scotland; and the old chronicler Wynton has preserved the following verses about him, which are extremely interesting, as being the most ancient specimen of the Scottish dialect now extant:—

'Quhen Alexandyr oure King was dede,
Dat Scotland led in luwe (love) and le (law),
Away wes sons of ale and brede,
Of wyne and wax, of gamyn (gamboling) and gle,
Oure gold was changed into lede.
Christ, born into virgynytè,
Succour Scotland, and remede,
Dat stad (placed) is in perplexytè.'

ALEXANDER, WILLIAM, a statesman and poet of Scotland, who flourished in the reign of James VI. [See STIRLING, EARL OF.]

ALEXANDER JAROSLAWITZ NEVSKOJ enjoyed a high renown among his countrymen for bravery, prudence, and religious zeal: he has been celebrated in many a Russian ballad, and is still venerated by the present generation. He was the second son of the Grand Duke Jaroslaw II. Wscladowitz, and was born at Wladimir in 1219. At the period when his father ruled over Novogorod, (in 1237,) the Tartars, with a tremendous army, under the command of the Khan of Kaptshak, a grandson of Tshingis Khan, invaded Russia, desolated the country in the most cruel manner, overran it even to the Upper Volga, and exacted the most degrading submission from the Russian princes. Jaroslaw, although not immediately attacked by the Tartars in his own Principality of Novogorod, found it advisable to repair to the great Tartar horde, stationed at that time in the region of the modern city of Kasan, to pay homage to Batu-Khan. From this Khan he received the grand duchy of Wladimir, to be held as a fief, made Perjaslawl his residence, and, as his elder son Feodor had died in 1232, he entrusted Alexander the younger with the government of Novogorod. Returning a second time to the great horde, and there remonstrating against certain unreasonable Tartarian commands, he met with ill treatment, and died on his homeward journey, in the month of September, 1245.

Alexander succeeded his father in the fief of Wladimir, the possession of which was confirmed to him by Batu-Khan. Alexander, while his father was still alive, had distinguished himself by two great victories, of one over the Swedes, and another over the united order of the Livonian and Teutonic Knights of the Sword. A crusade against the Russians had been instigated by Pope Gregory IX., who, by a bull of 1229, enjoined the bishops of Lübeck, Linkjöping, and Livlond, to prohibit all intercourse and commerce with the schismatic Russians, as long as they should resist the conversion of the apostate Finlanders. This, however, only was a negative measure; but the bull of the 14th May, 1237, by which the Livonian and Esthonian Knights of the Sword were united to the Teutonic order, evidently by way of strengthening them for a Russian crusade, tended in a more direct and positive manner towards the destruction of the Greek Church in the north-east of Europe. The Roman Court also opened negotiations with Eric the Eleventh, King of Sweden, who, at the pope's instigation, gladly sent an army against the Finlanders, which landed near the mouth of the Neva, on the spot where St. Petersburg has since been built. Alexander marched against this army, and, on the 15th of July, 1240, totally defeated it, at the confluence of the Ishora and the Neva. By this victory he obtained the honourable surname of Nevskoj, or Alexander of the Neva. While he was thus engaged, the Knights of the Sword, commanded by their chief, Hermann von Balk, had taken Pleskow. Early in the year 1241 Alexander marched against them from Novogorod, and drove them out of Pleskow; but, having allowed his army to disperse in the autumn, he next winter saw the enemy again in the field. The Knights of the Sword had advanced within thirty versts of the city of Novogorod. With great speed Alexander again collected his army, pursued the retreating enemy, and, on the 5th of April 1242, fought them on the ice of the lake of Peipus, where he gained a decisive victory: 400 Teutonic Knights were slain, and fifty were taken prisoners; those of the prisoners who were Germans were pardoned, but the Esthonians Alexander ordered to be hanged, considering them as Russian rebels. Alexander returned in triumph to Pleskow, having liberated that city and its commerce, which at that time was considerable, from the yoke of foreigners.

Arms proving unavailing, the Roman Court had recourse to diplomacy as a surer means for converting Alexander. Several attempts of this kind had been made in vain with his predecessors, by the popes Innocent III., Honorius III., and Gregory IX. Innocent IV. made a new trial, and in the year 1251 sent two cardinals, who, in Russian Chronicles, are called Gald and Gemont, as ambassadors to Alexander Nevskoj; they brought a letter from this pope, dated January 23, 1248, probably so long antedated, in order to show how long his holiness had been big with the scheme of the embassy, but Alexander remained inflexible, and the cardinals returned without effecting anything for the church of Rome.

Though Alexander was successful against the Pope, he continued a vassal of the Tartars as long as he lived; it does not, however, appear that Russia was during his reign actually invaded or plundered by them.

He repaired to the great horde three times, and died on his return from the last of these journeys at Kassimcow in 1263; from that place his body was removed to Wladimir, and there interred. It is a tradition that shortly before his death he took holy orders: but it probably has no good foundation. Alexander's wife was a daughter of Wrateslaw, Prince of Polotsk, by whom he had four sons: Vassilj, Dmitrij, Andrej, and Danilo. It is uncertain whether the valiant Jueje (George) who ruled over Novogorod till 1270, was also his son. The foundation of St. Petersburg in 1703, on the very spot where the national hero had gained such an important victory, naturally recalled the memory of Alexander Nevskoj in a lively manner. The Tzar Peter on this occasion instituted St. Alexander-Nevskoj's Order of Knighthood, but did not himself give that decoration to any man; this was first done after his death by his consort Catharine. There is also in St. Peterburg a St. Alexander-Nevskoj Monastery, which is well endowed, to which now is attached a seminary for the education of young divines called St. Alexander-Nevskoj's Academy.

ALEXANDER, Emperor of Russia, called by his countrymen Alexander Paulowitsch, that is, Alexander the son of Paul, was born on the 23rd December, 1777. He was the son of the Emperor Paul and of Maria, daughter of Prince Eugene, of Würtemberg. From his infancy he was distinguished for a gentle and affectionate disposition, and a superior capacity. His education was directed not by his parents, but by his grandmother the reigning Empress, Catharine II., who lived until he had attained his nineteenth year. Under her superintendence, he was carefully instructed by La Harpe and other able tutors in the different branches of a liberal education, and in the accomplishments of a gentleman.

Catharine was succeeded, in 1796, by her son Paul, whose mad reign was put an end to by his assassination on the 24th of March, 1801. No doubt can be entertained that Alexander, as well as his younger brother Constantine, was privy to the preparations which were made for the dethronement of his father, which had, indeed, become almost a measure of necessity; but all the facts tend to make it highly improbable that he contemplated the fatal issue of the attempt. The immediate sequel of this tragedy was a slight domestic dispute, occasioned by a claim being advanced by the widow of the murdered emperor to the vacant throne, who had not been admitted into the conspiracy; after a short altercation she was prevailed upon to relinquish her pretensions; and the grand duke Alexander was forthwith proclaimed emperor and autocrat of all the Russias. This collision does not seem to have left any unpleasant traces on the mind either of Alexander or his mother, to whom during his life he always continued to show respect and attachment. The Empress Maria survived her son about three years.

The history of the reign of Alexander is the history of Europe for the first quarter of the present century. We can here only attempt a slight outline of the course of events during that busy time, with a reference to the movements of the Russian emperor. When Alexander came to the throne, he found himself engaged in a war with England, which had broken out in the course of the preceding year. He immediately indicated the pacific character of his policy by taking steps to bring about a termination of this state of things, which was already seriously distressing the commerce of Russia; and a convention was accordingly concluded between the two powers, and signed at St. Petersburg on the 17th of June, 1801. The general peace followed on the 1st of October, and lasted till the declaration of war by England against France on the 18th of May, 1803. Meanwhile Georgia, hitherto under the protection of Persia and Turkey, had been occupied, on the invitation of the people themselves, by the troops of Russia, and incorporated with that empire. Alexander also, during this interval, showed his disposition to extend the influence of Russia in another direction, by entering into a negociation with France respecting the compensation to be granted to certain of the minor powers of Germany, with which country he was connected both through his mother, and through his father, who was born head of the house of Holstein-Gottorp. It was in the course of these negociations that he had his first interview with the King of Prussia, which is understood to have laid the foundation of an intimate friendship between the two sovereigns, and to have established a concurrence of views which powerfully influenced the future policy of each. In a dispute with Sweden, with regard to the frontier of Finland, although hostilities were averted by the concession of the Swedish king, the extensive military preparations which were immediately made by Russia, showed how little that power was disposed to allow the invasion of any of her rights.

Alexander did not immediately join England in the war against France; but even in the early part of 1804, symptoms began to appear of an approaching breach between Russia and the latter country. On the 11th of April, 1805, a treaty of alliance with England was concluded at St. Petersburg, to which Austria became a party on the 9th of August, and Sweden on the 3rd of October following. This league, commonly called the third coalition, speedily led to actual hostilities. The campaign was eminently disastrous to the allied powers. A succession of battles, fought between the 6th and the 18th of October, almost annihilated the Austrian army, before any of the Russian troops arrived. Alexander made his appearance at Berlin on the 25th, and there, in a few days after, concluded a secret convention with the King of Prussia, by which that prince, who had hitherto professed neutrality, bound himself to join the coalition. Before leaving the Russian capital, Alexander, in company with the king and queen, visited at midnight the tomb of the great Frederick, and, after having kissed the coffin, is said to have solemnly joined hands with his brother sovereign, and pledged himself that nothing should ever break their friendship. He then hastened by way of Leipzig and Weimar to Dresden, from whence he proceeded to Olmutz, and there, on the 18th November, joined the Emperor of Austria. On the 2nd of the following month, the Austrian and Russian troops, commanded by the two emperors in person, were beaten in the memorable and decisive battle of Austerlitz. The immediate consequences of this great defeat were, the conclusion of a convention between France and Austria, and Alexander's departure to Russia with the remains of his army.

Although Alexander did not accede either to the convention between France and Austria, or to the treaty of Presburg, by which it was followed, he thought proper after a short time, to profess a disposition to make peace with France, and negociations were commenced at Paris for that object. But after a treaty had been signed on the 20th of July, 1806, he refused to ratify it, on the pretence that his minister had departed from his instructions. The true motive of his refusal no doubt was, that by this time arrangements were completed with Prussia and England for a fourth coalition; and it is even far from improbable, that the negociations which led to the signature of the treaty had from the first no other object beyond gaining time for preparations. On the 8th of October hostilities recommenced, and the victory of Jena, gained by Bonaparte a few days after, laid the Prussian monarchy at his feet. When this great battle was fought, Alexander and his Russians had scarcely reached the frontiers of Germany; on receiving the news they immediately retreated across the Vistula. Hither they were pursued by Bonaparte, and having been joined by the remnant of the Prussian army, were beaten on the 8th of February, 1807, in the destructive battle of Eylau. Finally, on the 14th of June, the united armies were again defeated in the great battle of Friedland, and compelled to retreat behind the Niemen. This crowning disaster terminated the campaign. An armistice was arranged on the 21st; and five days after Alexander and Napoleon met in a tent erected on a raft in the middle of the Niemen, and at that interview not only arranged their differences, but, if we may trust the subsequent professions of both, were converted from enemies into warmly attached friends. A treaty of peace was signed between the two, at Tilsit, on the 7th of July; by a secret article of which Alexander engaged to join France against England. He accordingly declared war against his late ally, on the 26th of October following. The treaty of Tilsit indeed converted the Russian emperor into the enemy of almost all his former friends, and the friend of all his former enemies. Turkey, though supported by France, had for some time been hard pressed by the united military and naval operations of England and Russia; but upon Alexander's coalition with the French emperor, a truce was concluded between Turkey and Russia at Slobosia, August 24, and the Turkish empire was saved from the ruin which threatened it. A war with Persia, commenced in 1802, continued to be carried on with varying success.

On the 24th of February, 1808, Alexander, in obedience to the plan arranged with Napoleon, declared war against Sweden, and followed up this declaration by despatching an army to Swedish Finland, which, after a great deal of fighting, succeeded in obtaining complete possession of that country. On the 27th of September, the Russian and French emperors met again at Erfurt; many of the German princes, with representatives of the King of Prussia and the Emperor of Austria, also attended the Congress, which continued to sit till the 15th of October. On this occasion a proposal for peace was made to England in the united names of Napoleon and Alexander; but the negociations were broken off after a few weeks.

The friendly relations of Alexander with France continued for nearly five years; but, notwithstanding fair appearances, various causes were in the meanwhile at work which could not fail at last to bring about a rupture. The Russian autocrat having failed in the plan of policy with which he had begun his reign, and which seems to have contemplated the avoidance of war, but at the same time the exercise of a powerful foreign influence, appears to have resolved to try another game, and to see what he could gain by entering into confederacy with the great conqueror of nations. But the peace of Tilsit, and the new relations into which Russia was thrown, however much they may have been to the mind of the sovereign, entailed such privation and commercial suffering on the people of that country, by severing the connexion with England, as made it at length impossible to persist in this course of policy. In the meanwhile, however, the treaty of Vienna, signed on the 14th of October, 1809, which, following the battles of Esling and Wagram, dissolved the fifth coalition against France, increased the Russian dominion by the annexation of eastern Gallicia, ceded by Austria. The war with Turkey, also, which had been recommenced, continued to be prosecuted with success. But by the end of the year 1811, the disputes with the court of Paris, which ostensibly arose out of the seizure by Bonaparte of the dominions of the duke of Oldenburg, had assumed such a height as left it no longer doubtful that war would follow. A treaty of alliance having been previously signed with Sweden, on the 19th of March, 1812, Alexander declared war against France; and on the 24th of April he left St. Petersburg to join his army on the western frontier of Lithuania. The great events which followed may be supposed to be fresh in the memory of all but the youngest of our readers. On the 28th of May peace was concluded at Bucharest on advantageous terms with Turkey, which relinquished everything to the left of the Pruth. The immense army of France, led by Napoleon, entered the Russian territory on the 25th of June. As they advanced, the inhabitants fled as one man, and left the invaders to march through a silent desert. In this manner the French reached Wilna. On the 14th of July, Alexander had repaired to Moscow, from whence he proceeded to Finland, where he had an interview with Bernadotte, then crown prince of Sweden. Here he learned the entry of the French into Smolensk. He immediately declared that he never would sign a treaty of peace with Napoleon while he was on Russian ground. 'Should St. Petersburg be taken,' he added, 'I will retire into Siberia. I will then resume our ancient customs, and, like our long-bearded ancestors, will return anew to conquer the empire.' 'This resolution,' exclaimed Bernadotte, 'will liberate Europe.'

On the 7th of September took place the first serious encounter between the two armies, the battle of Borodino, in which 25,000 men perished on each side. On the 14th the French entered Moscow. In a few hours the city was a smoking ruin. We cannot pursue the story of Napoleon's homeward march, and the destruction of his magnificent army. Not fewer than 300,000 Frenchmen perished in this campaign. The remnant, which was above 150,000, repassed the Niemen on the 16th of December.

In the early part of the following year, Prussia and Austria successively became parties to the alliance against France. Alexander, who had joined his army while in pursuit of Bonaparte at Wilna, continued to accompany the allied troops throughout the campaign of this summer. On the 26th and 27th of August he was present at the battle of Dresden; and on the 18th of October at the still more sanguinary conflict of Leipzig. On the 24th of February, 1814, he met the King of Prussia at Chaumont, where the two sovereigns signed a treaty binding themselves to prosecute the war against France to a successful conclusion, even at the cost of all the resources of their dominions. On the 30th of March, 150,000 of the troops of the allies were before the walls of Paris; and on the following day at noon, Alexander and William Frederick entered that capital.

We shall not enter into the detail of the transactions which followed this event. Alexander, owing in a great measure to his engaging affability, as well as to the liberal sentiments which he made a practice of professing, was a great favourite with the Parisians. The conquerors having determined upon the deposition of Bonaparte, and the restoration of the Bourbons, Alexander spent the remainder of the time he stayed in inspecting the different objects of interest in the city and its vicinity, as if he had visited it in the course of a tour. He left the French capital about the 1st of June, and proceeding to Boulogne, was there, along with the King of Prussia, taken on board an English man-of-war, commanded by his present Majesty, then Duke of Clarence, and conveyed to Calais, from which port the royal yachts brought over the two sovereigns to this country. They landed at Dover on the evening of the 7th, and next day came to London. They remained in this country for about three weeks, during which time they visited Oxford and Portsmouth, and wherever they went, as well as in the metropolis, were received with honours and festivities of unexampled magnificence, amidst the tumultuous rejoicings of the people. From England, Alexander proceeded to Holland, and thence, after a short stay, to Carlsruhe, where he was joined by the empress. . On the 25th of July he arrived at his own capital of St. Petersburg, where his appearance was greeted by illuminations and other testimonies of popular joy.

The Congress of European sovereigns at Vienna opened on the 3d of November, 1814. In the political arrangements made by this assembly, Alexander obtained at least his fair share of advantages, having been recognized as King of Poland, which country was at the same time indissolubly united with Russia. Before the members of the Congress separated, however, news arrived of Bonaparte's escape from Elba. They remained together till after the battle of Waterloo; when Alexander, with the Emperor of Austria and the King of Prussia, proceeded to Paris, where they arrived in the beginning of July, 1815. On the 26th of the following September, the three sovereigns signed an agreement, professedly for the preservation of universal peace on the principles of Christianity, to which, with some presumption, if not impiety, they gave the name of the Holy Alliance. On leaving Paris, Alexander proceeded to Brussels, to arrange the marriage of his sister, the Grand Duchess Anne, with the Prince of Orange; and from thence, by the way of Dijon and Zürich, to Berlin, where he concluded another family alliance, by the marriage of his brother Nicholas, now emperor, with the Princess Charlotte, daughter of the King of Prussia. On the 12th of November he arrived at Warsaw, and after publishing the heads of a constitution for Poland, he left this city on the 3d of December, and on the 13th reached St. Petersburg.

No great events mark the next years of the reign of Alexander. On the 27th of March, 1818, he opened in person the first Polish diet at Warsaw, on the close of which he set out on a journey through the southern provinces of his empire, visiting Odessa, the Crimea, and Moscow. The congress of Aix-la-Chapelle, at which he was present with the Emperor of Austria and the King of Prussia, met in September, and on the 15th of the following month promulgated a declaration, threatening, in reference to the then state of Spain, the suppression of all insurrectionary movements wherever they might take place. The congresses held in 1820 and 1821 at Troppau and Laybach, on the affairs of Naples and Piedmont, and that of Verona in 1822, were also mainly directed by the Russian autocrat. Meanwhile the insurrection of the Greeks in 1820, although publicly condemned by Alexander, was attributed by Turkey to the secret encouragement of Russia, and seemed to threaten a renewal of hostilities between the two countries; but for the present Alexander determined to persevere in his pacific policy. In 1823, several tribes of the Kalmucks, who had formerly acknowledged the sovereignty of China, exchanged it for that of Russia.

In the beginning of the winter of 1825, Alexander left St. Petersburg on a journey to the southern provinces, and on the 25th of September arrived at Taganrog on the sea of Azof. From this town he some time after set out on a tour to the Crimea, and returned to Taganrog about the middle of November. Up to nearly the close of this latter excursion, he had enjoyed the highest health and spirits. But he was then suddenly attacked by the common intermittent fever of the country, and when he arrived at Taganrog he was very ill. Trusting, however, to the strength of his constitution, he long refused to submit to the remedies which his physicians prescribed. When he at length consented to allow leeches to be applied, it was too late. During the few last days that he continued to breathe, he was insensible; and on the morning of the first of December he expired.

It was for some time rumoured in foreign countries that Alexander had been carried off by poison; but it is now well ascertained that there is no ground whatever for this suspicion. It appears, however, that his last days were embittered by the information of an extensive conspiracy of many of the nobility and officers of the army to subvert the government, and even to take away his life; and it is not improbable that this news, which is said to have been brought to him by a courier during the middle of the night of the 8th, which he spent at Alupta, may have contributed to hasten the fever by which he was two or three days after attacked. For full details upon this subject, and a translation of the Report of the Commission appointed to inquire into the affair by the Emperor Nicholas, we refer the reader to vol. ii. pp. 333—435 of Webster's *Travels in the Crimea, Turkey, and Egypt*; London, 1830.

The death of Alexander took place exactly a century after that of Peter the Great, under whom the civilization of Russia may be said to have commenced. The state of the empire did not change so completely during Alexander's reign, as it did during that of Peter; but still the advancement of almost every branch of the national prosperity in the course of the quarter of a century during which Alexander filled the throne was probably, with that one exception, greater than had ever been exhibited in any other country. The reader will find in the 13th chapter of a *Sketch of the Life of Alexander*, by H. E. Lloyd, Esq., (8vo., London, 1826,) an ably drawn up account of the emperor's internal administration of his dominions, and of the various improvements which were introduced under his auspices. At the head of these are to be reckoned his exertions for the diffusion of education among his people. He founded or reorganized seven universities, and established 204 gymnasia, and above 2000 schools of an inferior order. (See *Journal of Education*, No. V.) The literature of Russia was also greatly indebted to his liberal encouragement, although he continued the censorship of the press in a modified form. He greatly promoted among his subjects a knowledge of and taste for science and the fine arts by his munificent purchases of paintings, and anatomical and other collections. The agriculture, the manufactures, and the commerce of Russia were all immensely extended during his reign. Finally, to Alexander the people of Russia were indebted for many political reforms of great value. Certain checks were applied to the arbitrary authority of the monarch, by rights granted to, or recognized in, the senate; the provincial governors were subjected to more effective control; the laws were improved by a mitigation of the severity of the old punishments, and in various other respects; personal slavery was entirely abolished; and even of the serfs attached to the soil, great numbers were emancipated, and arrangements made for the eventual elevation of all of them to a state of freedom. Under Alexander also, both the extent and the population of the Russian dominions were greatly augmented; the military strength of the nation was developed and organised; and the country, from holding but a subordinate rank, took its place as one of the leading powers of Europe.

Alexander was married on the 9th of October, 1793, to the Princess Louisa Maria Augusta of Baden, who, on becoming a member of the imperial family, assumed the name of Elizabeth Alexiewna. By her, however, he had no issue. On his death, his next brother, the Grand Duke Constantine, was proclaimed king at Warsaw; but he immediately surrendered the throne to his younger brother, the present Emperor Nicholas, according to an agreement made with Alexander during his lifetime.

ALEXANDERS. [See Smyrnium.]

ALEXANDRETTA. [See Scanderoon.]

ALEX'ANDRIA, Modern, called *Iskanderieh* by the Arabs, the only port of Egypt, stands on an artificial neck of land which joins the continent to the ancient island, now the peninsula, of Pharos; 31° 13′ N. lat. 29° 53′ E. long. We shall first describe its present appearance, and then give a short sketch of its origin, its ancient condition, and its existing monuments.

The district around Alexandria consists of a long narrow strip of land, bounded on one side by the Mediterranean, and on the other by the Lake Mareotis. At the time of the French invasion in 1801, this lake was dry; but the British troops, during the siege of Alexandria, by cutting a passage through the narrow neck of land that separates it from Lake Aboukir or Madieh, let in the sea, and restored the bed of the Mareotis to the dominion of the water. The immediate territory of Alexandria, thus limited by the sea and the lake, extends from the tower of the Arabs, which is west of the town, to Cape Aboukir east of it: the width of this tract near the city may be seen from the accompanying plan. The whole of this district is a continuous chain of calcareous rock and sand, without good water, and almost without vegetation.

There are two ports. The old port is at the extremity of an extensive roadstead, the entrance to which lies across a chain of rocks stretching from Cape Marabout on the main land to the Cape of Fig Trees, which is the western extremity of the island of Pharos. There are three passes into the road, the deepest of which will admit frigates, and probably vessels of the line. The port itself, which is at the eastern extremity of the roadstead, is sheltered from the violent winds that blow between N.W. and N.E. by the high coast of the island of Pharos. The anchorage is good, and the port might be made one of the most convenient in the world. The new port has also a line of rocks stretching across the entrance, and it is further exposed to the violent north and north-east winds which sometimes render it impracticable to anchor there. It is also very shallow in many parts, owing both to natural rocks and to sand and rubbish which have been thrown into it. The currents of the sea also sometimes bring sand; and the constant decomposition of the calcareous rock, which in some part lines it, contributes still further to choke it up. It is stated in the public prints that the present Pasha is going to lay out a large sum in improving the ports of Alexandria. The passage into the new port is about 650 feet east of the Diamond Rock, and the fort of the Pharos. This fort is also a light-house, and is connected with the island Pharos by an artificial dyke, made in part of ancient granite columns laid transversely. The island of Pharos itself consists of a saline arid soil and dazzling white calcareous rock: it is bordered with reefs, especially on the west side. The Arabs calls it *Roudah el Tyn*, or Garden of Fig Trees, because this fruit is successfully cultivated on this otherwise barren spot. The island shows many traces of ancient building, such as we know existed under the Greek dynasty and the Roman empire.

The modern town occupies the neck of land between the two ports, which was originally intended merely to form a communication with the Pharos: but in consequence of the continual increase which it receives, it has gradually become the chief inhabited part. Such quays and jettees as there are on the two ports, are, in a great measure, formed of the materials of old Alexandria. The mosques, the public warehouses, and even the private dwellings contain fragments of granite, marble, and other stones, which clearly indicate that they once belonged to ancient edifices. The streets are narrow, and unpaved, full of dust in dry weather and of mud when it rains: the houses, both internally and externally, present no great attractions, and the general appearance is, to a European, dreary and monotonous. The town contains a great number of mosques, and some public buildings, such as the custom-house, new palace, marine arsenal, and the fortifications. The mosque called that of the Thousand and One Pillars is the chief ecclesiastical building. Alexandria is still a place of considerable trade, being the chief port by which the products of Egypt are exchanged for those of the various countries of Europe. Most of the European nations have a consul resident at Alexandria. The population, at the time of the French evacuation in 1801, was only about 7000: at present it is said to amount to above 25,000. In the bazaars may be seen a motley population, composed of Turks, Egyptians, Arabs, Greeks, Jews, and the various natives of Europe that trade with Alexandria. In 1827, 605 ships entered the port, and 622 cleared out; in 1828 there were 891 arrivals, and 865 departures. The particular arrivals of the latter year will give a better idea of the trade of Alexandria:—

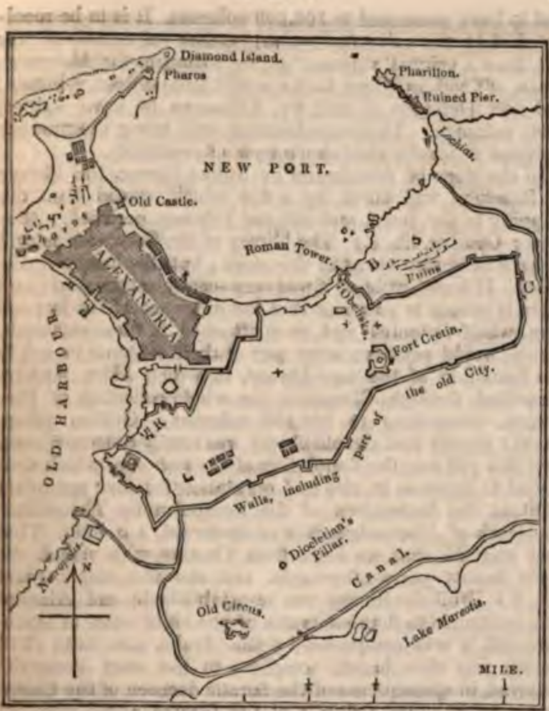
	Arrivals.	Departures.
Austrian,	293	284
Danish,	1	3
English,	136	135
French,	139	152
Ionian Islands,	102	93
Netherlands,	3	1
Prussian,	2	2
Papal,	6	8
Russian,	23	26
Sardinian,	110	91
Sicilian,	14	10
Spanish,	15	17
Swedish,	13	13
Tuscan,	34	30

The rise of the sea at Alexandria is not regular; the greatest elevation is due to the winds that blow between the points of west and north-east, and even this does not amount to more than from nineteen to twenty-five inches. The climate of Alexandria is in general pretty good, though the occasional visitations of the plague in modern times have given rise to a contrary opinion; but the ravages of epidemics are perhaps to be attributed more to the character and habits of the people than to the climate. The winter, during which there is a great deal of rain, is the most unhealthy season: the French army lost 1650 men during the months of December, 1798, and January and February, 1799.

Alexandria communicates with the Rosetta branch of the Nile at Foua by means of a canal, called the Mahmoudy, constructed under the present governor Mohammed Ali. This canal was restored and completed in 1820 by the labour of 150,000 Fellahs, of whom it is said that 20,000 died of fatigue. The whole length of the canal is about forty miles, but it is already much injured by deposits of mud, and can only be navigated when the waters of the Nile are high.

As the town has no fresh water, the inhabitants are obliged to have recourse to the cisterns which are annually filled partly by the winter rains, and partly by water brought from the canal. [See ABERCROMBY.]

ALEXANDRI'A, ANCIENT, owes its origin to Alexander the Great, who, during his visit to Egypt, (B.C. 332,) gave orders to erect this city between the sea and the Mareotic Lake. The architect was Dinocrates, a Macedonian. A large part, but not the whole of it, was contained within the present walls, which are chiefly the work of the Arabs. One main long street, thirty stadia in length, ran through the city from the eastern extremity to the Necropolis at the western, and this was intersected by another main street, ten stadia in length, running nearly north, in a direction from the Mareotic Lake. The object of this arrangement was to give the city the benefit of ventilation from the north winds. The main land and the island of Pharos were connected by a dyke, called the Heptastadium, in which, at each end, there was a passage for vessels from one port to the other. Over these passages there were also bridges; and we are told that water was conveyed along the dyke to the island of Pharos, though we do not understand how this was managed, unless the bridges must have been very high. On the rocks now occupied by the present Pharos, a magnificent light-house was constructed by Sostratus of Cnidus, in the reign of Ptolemy Philadelphus (B.C. 283): its height is stated, though probably with much exaggeration, to have been 400 feet. The point opposite to the Pharos was called Lochias; and as the Lochias itself was prolonged towards the Pharos along some rocks, on which the Pharillon now stands, this prolongation received the name of Acro-Lochias, or the Point of Lochias. In advancing from Lochias towards the obelisks, we traverse the ground where stood the palaces of the Ptolemies, the theatre, and various temples. The port bounded by the two promontories, by the north-east part of the city, and the Heptastadium, was called the Great Port. The other port was called Eunostus (safe return): it contained also a small port called Kibotos, or 'the Chest,' because the entrance could be completely closed; no traces of it, as far as we can learn, can be made out. A canal which united the lake with port Eunostus terminated in or near port Kibotos, and was nearly the S.W. limit of the city. Still farther S.W. was the Necropolis, (city of the dead,) or great cemetery of Alexandria. This city in its full extent was divided into several quarters, but we cannot assign either the names or the exact limits of each. The court end, otherwise called Bruchion (B) comprised the part between the Lochias, the site of the Obelisks, and the eastern or Rosetta gate (C). It contained also the Museum. The Rhacotis (R) bordered on port Eunostus, and contained the great temple of Serapis, which, after the



From the survey of Capt. W H. Smyth.

establishment of Christianity, was for a long time a grievous offence to the Christians. Theophilus, the patriarch of Alexandria, obtained permission from the emperor Theodosius (A.D. 390) to destroy this edifice; and no one could accuse him of executing the commission imperfectly. A place called *Soma*, (the body,) in the quarter of the palaces, contained the tomb of Alexander the Great. Besides the canal which united the port Eunostus with the lake, there was also a canal from the lake to the town of Canopus, situated near the mouth of the western branch of the Nile. By means of this canal the city was supplied with river water, which was kept in cisterns. These were so numerous that a Roman writer tells us, (*De Bello Alexandrino*, cap. v.) 'nearly all Alexandria was undermined, and furnished with subterranean aqueducts to convey the Nile water to private houses, where after a short time it became purified.' Innumerable traces of such constructions are found on the site of old Alexandria.

The city was embellished by the Ptolemies with the spoils of the ancient towns of Egypt, and for several centuries continued to receive accessions and improvements. At one time it was the rival of Rome in size, and the first commercial city of the earth. It became, what Tyre had been before, the point of exchange for the eastern and western world, but with a commerce more widely extended after the conquests of the Macedonians had laid open the eastern world to Greek enterprise. Diodorus, who visited Alexandria just before the downfall of the empire of the Ptolemies, says, that the registers showed a population of more than 300,000 free citizens.

The enclosure which is surrounded by a double wall flanked with lofty towers, contains the remains of old Alexandria,—an almost shapeless mass of rubbish, in which we see fragments of broken columns and capitals, pieces of wall, cisterns half choked up with earth, bits of pottery, glass, and all the signs of complete desolation. There are five gateways or entrances into this enclosure. Of the two granite obelisks, commonly called Cleopatra's Needles, one is still standing; the other is lying near it on the ground. The dimensions of the two are pretty nearly the same. The whole height of the erect obelisk, including the pedestal and the three steps, all of which are covered with earth, is about seventy-nine feet. When the French examined the base of this obelisk, the accumulation of earth around it was about sixteen feet deep. It has suffered considerably, like all the remains, and even the natural rocks, of Alexandria, from the action of the atmosphere: the west side is in the best state of preservation, and the south the worst of all. These two obelisks formed the entrance to the temple or palace of Cæsar, as it is called, though there is no doubt that they were moved from some of the ancient cities of Egypt by the Ptolemies. Near the two obelisks is part of a tower called 'the Tower of the Romans,' and probably it may be correctly named.

About the centre of the enclosure stands the mosque o. St. Athanasius, on the site of a Christian church erected by this patriarch during the fourth century. In this mosque the French discovered the beautiful SARCOPHAGUS of Egyptian breccia, which is now in the British Museum. It was ungenerously required of the French at the capitulation of Alexandria, (1801,) together with other monuments of antiquity, which they had collected with great pains. Near the mosque are the shafts of three colossal pillars of red granite, which are the only remains of a large number that once existed in this part of the city; but it is not possible now to determine to what kind of an edifice they belonged.

The cisterns for keeping the Nile water are still in great part preserved. They consist of vaulted chambers supported by columns, which form arcades of two or three stories. (See *Plans*, &c., *Egypte, Antiq.*, vol. v., pl. 37.) The interior walls are covered with a thick red plaster that is not permeable to water. The level of these cisterns varies, but some of them are from fifteen to eighteen feet below the level of the sea. At the time of the French occupation of Alexandria, there were about 308 of these cisterns known to exist, though many more are doubtless buried beneath the rubbish: the number in use at that time was 207.

The only remarkable monument between the wall and the lake is the column commonly called Pompey's Pillar. It stands on a mound of earth about forty feet high, which contains remains of former constructions. The shaft, which consists of a single piece of red granite, is about sixty-seven feet long, and weighs at least 276 tons: the whole height, with the capital, which is in bad taste, and the base and pedestal, which are no better, is about ninety-four feet. According to a Greek inscription on the plinth of the base, on the west side, it appears to have been erected (though perhaps not for the first time) in honour of the Emperor Diocletian by a prefect of Egypt whose name cannot be further deciphered than that it begins with PO. The foundation of this pillar has evidently often been examined, probably with the hope of finding treasures; and it is, perhaps, owing to this disturbance that it is inclined about seven inches to the S.W. Amidst the broken materials around its base we discover the centre stone on which it rests: this is a piece of yellowish breccia, with Egyptian hieroglyphics on it, placed the wrong end upwards.

Having crossed the canal, in going S.W. from the pillar, we come to some catacombs cut in a small elevation of a sandy calcareous stone; and farther south, in the calcareous rock that faces the sea, we find almost countless excavations, in the sides of which niches are cut: these once formed part of the Necropolis, or burial-place of old Alexandria. The most spacious of these, which, like the rest, communicates with the sea by a narrow passage, is about 3830 yards S.W. of the column, and is near the place called by the inappropriate name of Cleopatra's Baths. In the interior we find a great number of chambers and passages cut in the rock in such a style of decoration as proves their Greek origin. Such a monument could only be intended for a king. (See Plates, *Egypte*, v. 42, for the plan; and Mayer's *Views in Egypt*.)

The history of this city is as remarkable as its monuments once were. We can here only indicate its great epochs. From B.C. 323 to B.C. 30, when it fell into the hands of the Romans, it was the residence of the Greek kings of Egypt, the resort of commerce, and of many foreign nations, especially Jews; and also the centre of the scientific knowledge of that day. In the campaigns of Julius Cæsar at Alexandria, B.C. 48, the place sustained much damage.

From B.C. 30 to the Arab conquest under Omar, A.D. 640, Alexandria was still a flourishing city under the Roman emperors, and afterwards under the eastern empire. Alexandria early adopted the Christian religion, and became one of the strongholds of the true faith. It was also the theatre on which the Christians showed their most determined hostility to all the works of Pagan art.

In 969, the Fatemite caliphs seized on Egypt and built New Cairo, from which time Alexandria declined still more, and sunk to the rank of a secondary Egyptian city: the discovery of the route round the Cape of Good Hope in 1497, tended still further to diminish the commercial importance of Alexandria.

For more information on the history and antiquities of Alexandria, see Diodorus, *lib.* xvii. Strabo, *lib.* xvii. D'Anville, *Egypte. Description de l'Egypte,* and the plates, vol. v. (Pococke. Niebuhr.)

ALEXANDRIA, a town and port of entry in the United States of North America, in the district of Columbia, on the west or Virginia side of the Potomac, and about 105 miles from the mouth of the river; 38° 49′ N. lat. Ships of the line can ascend the river as far as Alexandria, which is the most distant point from the ocean to which vessels of the largest size can be navigated in the United States. The whole voyage from the ocean through the entrance of Chesapeake bay to Alexandria is about 200 miles. Alexandria lies about five miles direct distance S.S.W. of the Capitol at Washington: the communication across the Potomac is kept up by a wooden bridge a mile in length.

The town slopes down to the river with the streets at right angles to one another, and is on the whole pretty well built. It has a court-house, gaol, alms-house, a theatre, market-house, and places of worship. Good wharfs extend along the river about half the length of the city, and allow the largest vessels to come up to them. The chief trade of the place is in flour, a great part of which is brought from the Shenandoah valley of Virginia, and the back part of Pennsylvania. The population of Alexandria in 1800 was 4196; in 1810, 7227; in 1820, 8218, of whom 2603 were blacks. The canal from the Ohio to Washington, when completed, will probably much increase the trade of this town. (Darby's *Geog. of the United States.—Encyclop. Americana,* &c.)

Returns of shipping at the port of Alexandria:—

	From Sep. 1, 1828, to August 31, 1829.	From Sep. 1, 1829, to August 31, 1830.	From Sep. 1, 1830, to August 31, 1831.
	Tons.	Tons.	Tons.
American vessels entered,	7825	8238	4167
„ departed,	11,401	12,727	14,986
Foreign vessels entered,			872
„ departed,	261		878
Registered tonnage belonging to the port employed in coasting trade, . .	5908	4403	4462
Steam vessels, . . .	246	330	378
Enrolled and licensed tonnage, ...	10,137	3972	3937

ALEXANDRIAN LIBRARY, a celebrated collection of books, formed and maintained by the first Ptolemy, king of Egypt, and his successors; and probably the largest which was ever brought together before the invention of printing. It is said to have been founded by Ptolemy Soter, after he had associated his son, Ptolemy Philadelphus, with him on the throne (and therefore between B.C. 285 and 283), in consequence of the suggestions of Demetrius Phalereus, who had seen and profited by public libraries at Athens. Demetrius was appointed superintendent of the new establishment, and busied himself diligently in collecting the literature of all nations, Jewish, Chaldee, Persian, Ethiopian, Egyptian, &c., as well as Greek and Latin. Some authors assert that, before his death, he had brought together 200,000 volumes; but Eusebius says, with more probability, that at the death of Ptolemy Philadelphus, which occurred later, there were but 100,000 volumes in the library. It was situated in the quarter of Alexandria called *Bruchion.* Philadelphus purchased the library of Aristotle. (Athenæus, b. 1.) Ptolemy Euergetes, who succeeded Philadelphus, and was a warm patron of learning, also took a great pleasure in increasing the library. In the reign of Ptolemy Epiphanes, Eumenes, king of Pergamus, established a rival library. The Egyptian monarch, in a fit of jealousy, forbade the exportation of paper (*papyrus*) from his dominions; and the invention of parchment, or, perhaps, the improvement of this material (*charta Pergamena*), was the consequence. (Pliny.) Ptolemy Physcon (or Euergetes II.) was also a great book collector; and is said to have commenced a second library, probably that which was placed in the Serapeion, or temple of Serapis, in a different quarter of the city. It is said that during his reign all books brought into Egypt were seized, and sent to the Museum, as it was called, where they were transcribed, and the copies delivered to the owners, while the originals were detained in the library,—a royal road to the formation of a valuable collection. Almost all the Ptolemies were patrons of learning; and at last the Alexandrian Library is said to have amounted to 700,000 volumes. It is to be recollected that the rolls (*volumina*) spoken of contained far less than a printed volume: as, for instance, the *Metamorphoses* of Ovid, in fifteen books, would make fifteen volumes; and one Didymus is said by Athenæus to have written 3500 volumes. This consideration will bring the number assigned at least within the bounds of credibility.

In the siege of Alexandria by Julius Cæsar, the library in Bruchion was burnt by a fire which spread from the shipping to the town, and 400,000 volumes perished. (Seneca; Orosius, lib. 6.) The library of the Serapeion is said to have been also burnt in this siege; but this has been disputed. If burnt, at least it was very soon re-established; and there is reason to presume that the diligence of the learned men, who frequented and were attached to these establishments, would preserve some part of their contents to aid in the formation of the new library, to which Marc Antony presented, through Cleopatra, the whole collection of Pergamus, amounting to 200,000 volumes. Gibbon (chap. xxviii.) asserts that the old library was totally consumed, and that this gift was the foundation of the new one, which continued to increase in size and reputation for four centuries, until, at the destruction of the Serapeion by Theophilus, Patriarch of Alexandria, it was dispersed, A.D. 390. That this was the case we learn from Orosius, who visited the place twenty years afterwards, and saw the empty cases (lib. 6.) Still the library was re-established; and Alexandria continued to flourish as one of the chief seats of literature, till it was conquered by the Arabs, A.D. 640. The library was then burnt, according to the story generally believed, in consequence of the fanatic decision of the Caliph Omar,—'If these writings of the Greeks agree with the Book of God, they are useless and need not be preserved: if they disagree, they are pernicious and ought to be destroyed.' Accordingly, it is said, they were employed to heat the 4000 baths of the city; and such was their number, that six months were barely sufficient for the consumption of this precious fuel. (Gibbon, chap. li.) Gibbon has employed his ingenuity to discredit this account, which in itself appears by no means improbable. The library was, at all events, dispersed, if not destroyed: it ceased to exist as a public institution.

Connected with the library of Bruchion was a college, or retreat for learned men, called the Museum, where they were maintained at the public expense, in unbroken leisure, and with every facility for the pursuit of knowledge. This establishment was subsequently transferred to the Serapeion, and continued to flourish till the destruction of the temple by Theophilus. The sciences of mathematics, astronomy, and geography, were especially cultivated: witness the names of Euclid, Apollonius, Eratosthenes; and, in later times, of Ptolemy the geographer. Criticism, philology, and antiquities, were also much studied. Alexandria continued, until its capture by the Saracens, one of the most noted seats of learning in the world. (*Acad. des Inscriptions,* tom. ix. p. 397; Gibbon, chap. li., and the original authorities quoted in these works.)

ALEXANDRIAN CODEX, a celebrated manuscript of the Old and New Testament, in Greek, now preserved in the British Museum. It was sent by Cyrillus Lucaris, patriarch, first of Alexandria, then of Constantinople, to Charles I.; was placed in the royal library in 1628; and continued there until that collection was removed to the British Museum, in 1753. The history of the MS., before its transfer to Charles I., is involved in much uncertainty. For some time the received account was, that it was written in Egypt by a woman named Thecla, in the latter half of the fourth century, and was brought from Alexandria by Cyrillus. This minute specification of name and date rests entirely on two documents affixed to the book itself; one a short note in Arabic, merely stating that, according to tradition, the book was written by the martyr Thecla. The other is a Latin autograph of Cyrillus, of which this is a literal translation. 'This book of the Old and New Testament, as we have it from tradition, was written by the hand of Thecla, a noble Egyptian woman, about 1300 years ago, a little after the council of Nicæa. The name of Thecla was written at the end of the book: but on the extinction of Christianity in Egypt by the Mohammedans, the books of the Christians were reduced to the same condition. The name, therefore, of Thecla has disappeared and is torn out, but memory and recent tradition preserves it.—Cyrillus, Patriarcha Constanti.' The high character of Cyrillus places him above the suspicion of intentional fraud: but his statement is vague and unsatisfactory. Why the Mohammedans should spare the book, but tear out the transcriber's name; what is the value of the tradition which asserts the name of Thecla to have been written at the end of the book; how is that Thecla to be identified with the Thecla who lived after the Nicene council, when the existence of three Christian Theclas, two of them martyrs, is noted in the Fathers, and there may have been three thousand—these are questions on which the passage above quoted throws no light, nor can they be answered from external evidence. On the other hand, a passage in the letters of John Rudolph Wetstein, uncle to the celebrated critic of that name, has been brought forward to convict Cyrillus of inaccuracy, if not fraud: in which the writer asserts on the authority of Matthæus Muttis, his instructor in Greek, who had been ordained deacon by Cyrillus, that the patriarch brought the manuscript from one of the monasteries on Mount Athos, well known as a great repository and manufactory of Greek MSS. Now Cyrillus passed some time at Mount Athos before he went to Alexandria, so that he may have brought it originally from Mount Athos, and yet have taken it from Alexandria to Constantinople; and, further, he does not say that he brought it from Alexandria, though his note, above quoted, indicates that it was written, or at least had been deposited in Egypt. This is rendered probable by internal evidence. Moreover, it appears to have been dedicated at some time to the use of the Alexandrian patriarch, if we may trust the following interpretation of an Arabic note at the foot of the first page of Genesis. It is to be observed, however, that the passage is confessedly very hard to be understood, and that a different version was given by Mr. Baber in his notes, from that which he subsequently adopted in the prolegomena of his edition, which runs thus:

> 'This book is dedicated to the patriarchal chamber in the fortified city of Alexandria. Whoso shall take it thence, be he excommunicated, torn forcibly from the church, and communion of men. 'Athanasius the humble.'

Two patriarchs of this name presided over the church of Alexandria after the Saracen invasion, one at the end of the thirteenth, the other in the fifteenth century,—either of whom may have written this. It seems, therefore, that there is no ground for charging Cyrillus with fraud.

The real age and value of this MS. has been much controverted. By some commentators it is said to be the oldest, and most valuable copy of the New Testament in existence: others deny its very remote antiquity, and equally depreciate its merit. Mill and Woide admit the date assigned by Cyrillus. Oudin would bring it down even to the tenth century. Michaelis thinks its date cannot be ascertained within a period of about 200 years, and that it cannot be older than the sixth, nor later than the eighth century. Its authority is as much controverted as its age. Mill believes it to be the most perfect copy existing of the Apostolic text. Wetstein and Michaelis alike speak slightingly of its readings. Griesbach asserts that it follows three different editions: the Byzantine in the Gospels; the Western in the Acts and Catholic Epistles; and the Alexandrine in the Epistles of St. Paul. These points have been minutely discussed by Dr. Woide, formerly librarian of the British Museum, who published a fac-simile of the New Testament, in his preface. As might be expected, he is a staunch advocate of the excellence of his MS. A second edition of the preface (Notitia Codicis Alexandrini) was published by Spohn, who controverted many of Woide's opinions, showed that the MS. was by no means free from blunders of transcription, and reduced both its age and authority to a much lower standard. It has received great attention from biblical critics, and has been collated, among other persons, by Mill, Wetstein, and by Woide, who has given a very copious and complete collection of its variations from the received text as edited by Mill. This is to be found in a cheaper form in Spohn's edition of the *Notitia*, Lips. 1788.

The MS. is contained in four volumes, of the shape and size of large quarto, of which the New Testament fills the last. It is written on vellum, in double columns, in uncial or capital letters, without spaces between the words, accents, or marks of aspiration. The letters are round and well formed. Some words are abbreviated, but they are not very numerous. There is a variety in the colour of the ink, and formation of the letters, which indicates that it was not all written by the same hand. The MS. is on the whole in good condition; but sometimes the ink has eaten through the parchment so as to leave holes, in which, however, the shape of the letters can generally be traced; sometimes the ink itself has scaled off. It has suffered more seriously from the loss of the upper corner of the inner margin, which has been shaven off, why, or by what accident, it is not easy to guess. Sometimes only the margin has suffered, and the text is untouched: sometimes the beginning or end of eight, ten, or more lines is destroyed. The New Testament has been more injured from this cause than the Old. St. Matthew is wanting up to chap. xxv. 6, where it begins with the word ΕΞΕΡΧΕΣΘΕ: there are also chasms in St. John, from vi. 50, to viii. 52, and in 2 Cor., from iv. 10. to xii. 7.

The New Testament has been more fully described, and more carefully collected than the Old; from which, however, Grabe published his splendid edition of the Old Testament, Oxf. 1717—20. They are uniform in appearance and execution, but the Old Testament seems to be in rather better condition. Here and there a leaf has been partially destroyed; but there are, we believe, no considerable chasms. It contains, besides all the canonical, and most of the apocryphal books found in our editions, the third and fourth books of the Maccabees, the Epistle of Athanasius to Marcellinus, prefixed to the Psalms, and fourteen hymns, the eleventh in honour of the Virgin. Ecclesiasticus, the Song of the Three Children, Susannah, and Bel and the Dragon, do not appear to have formed part of the collection. The New Testament contains the genuine Epistle of Clement to the Corinthians, and part of the other which has been attributed to him. This is the only known manuscript in which the genuine Epistle exists. A fac-simile of the Old Testament has been published by the Rev. H. Baber, of the British Museum.

For more minute information, we may refer to Woide's *Notitia*, especially as edited by Spohn: to Michaelis's Introduction to the New Testament; and the Prolegomena of Mill, Wetstein, Grabe, and Baber.

ALEXANDRINE VERSE, a species of verse so called from having been first employed, according to some authorities, in a French translation, by Alexander de Paris and Lambert Lieon, of a Latin poem called the Alexandriad, according to others in an original work in the former language, on the life of Alexander the Great, composed by these poets in association with Jean le Nivelois and others. After its first introduction, it appears to have fallen for a long time into disuse among the French poets, until it was revived by Jean Antoine de Bœuf (one of the seven called the Pleiades), in the reign of Francis I. The first, however, who attuned the national ear of France to this verse, was the celebrated Ronsard, since whose time it has become the regular heroic verse of the French language; or that in which all their epic, tragic, and other greater poetical works are composed. It consists of twelve syllables, subject to the rule that it shall always be broken into two regular hemistichs, or, in other words, that its sixth syllable shall always terminate a word. The English Alexandrine verse consists in like manner of twelve syllables; but among us it has been rarely used throughout a whole poem. The longest and most remarkable poetical work in our language, written wholly in Alexandrine verse, is Drayton's *Polyolbion*. In general, it is employed only occasionally in poems written in our usual heroic verse of ten syllables, and never except in the concluding line of the couplet or triplet. In Dryden, by whom it has been used in this manner most frequently, and with the finest effect, it most commonly winds up a triplet—such as that in which Pope has at once described and exemplified the manner of his great predecessor:

> 'Waller was smooth; but Dryden taught to join
> The varying verse, the full resounding line,
> The long majestic march, and energy divine.'

The Alexandrine verse in English also forms the closing line of what is called the Spenserian stanza. Regularly, it ought always, as in French, to be divisible into two hemistichs; but, in the freer spirit of our poetry, this rule is occasionally violated.

ALEXEI MICHAILOWITZ, born at Moskwa in the year 1630, was a son of the Tzar Michäilo Feodorowitz Romanow, the first of the house of Romanow that held the sceptre of Russia, and of his second consort Evdokia Lukianowna Streshnew. At the death of his father, July 12, 1645, he succeeded to the crown, and as he was still very young, he was mainly guided by the advice of his councillors; Morosow, his tutor and brother-in-law; Miloslawskoj; and Plessow, a judge in one of the high courts at Moskwa. The excessive avarice and despotism of these men caused an insurrection in Moskwa, in 1648, in which Plessow and several of their creatures were murdered. The Tzar's intercession with difficulty saved Morosow from the people's fury.

Two impostors disturbed the tranquillity of Alexei's reign. Both of them chose Poland as their first scene of action. One of them, called Dmitri, pretended to be a son of Otrepiew, (who, by way of distinction, was called the *false Dmitri,*) and of Marina; he was treated like a prince by Wladislaw, king of Poland, but had to leave that country when the king died. He then went to Sweden, and from thence to Holstein, where he was arrested, delivered up to Russia, and put to death in Moskwa. The other impostor's real name was Timoka Ankudinow. On account of some crimes he left his country, and sought refuge in Poland, where he declared himself to be a son of the late Tzar, Wassili Shuiskoi; but receiving no countenance, he went to Constantinople, where, in order to make himself popular with the Turks, he submitted to the ceremony necessary to become a Mohammedan. Finding even this fruitless, he wandered about in Italy, and having become a Catholic in Rome, he roved through Austria, Hungary, and Transylvania. He next obtained from the Prince Ragotzy a letter of recommendation to the Queen Christina of Sweden, who received him well, and even granted him a considerable pecuniary allowance. Alexei, resenting this, insisted on his being delivered up; but the impostor escaped from Stockholm, and likewise from Revel, although in the latter place he had been put in prison. In Germany, he adopted the Lutheran religion: but at last, at the instance of Russia, he was arrested in Holstein, and in the year 1653 brought to Moskwa, where he was put to death, after suffering severe torture.

These impostors would hardly deserve notice, were it not for a war which broke out between Russia and Poland in 1654, the real cause of which was the countenance given to these adventurers in Poland. The immediate cause of the war was the protection granted by Russia to certain Cossacks subject to the Poles.

In this war the Polish commander-in-chief, John Radzivil, was completely defeated at Sklovo; the Russians took Smolensko in 1654, and almost the whole of Lithuania was conquered and devastated by them. The Poles, being at this time severely pressed by the Swedes, found it advisable, after two years' war, to agree to an armistice, which was concluded at Nienietz, in November, 1656, Austria being on this occasion the mediator. The Poles agreed to cede the provinces of Smolensko, Tshernigow, and Seweria to the Russians, for a sum of money.

Alexei's second war, which was against Charles Gustav of Sweden, commenced before the armistice with Poland was concluded. After the armistice, Alexei, agreeably to a promise given to the Poles on that occasion, carried on the war with great vigour. The cause of complaint on the part of the Russians was, that Gustav had hindered the operations of their army in Lithuania. The Russians entered Karelia, Ingermania, and Livonia with 120,000 men, and the Knies, Dolgorukoi, took Dörpt, and frightened away the professors of the university. But the Russians were compelled to raise the siege of Riga, after six weeks, (from the 20th of August to the 5th of October, 1656,) with the loss of 14,000 men; owing to the vigorous resistance of the renowned Swedish general, Magnus de la Gardie. In the year following, on the 9th of July, the Russian army, under the command of Matthias Wassiliewitz Ishermetiew, was completely routed by the Swedish general Fritz von Löven at Wolk, and the Russian commander died of his wounds a few days after the battle. A new army of 30,000 men entered Livonia, but, without effecting any thing, was compelled by the plague to march off. This induced Alexei in his turn to agree to an armistice with Sweden, which was signed on the 23rd of April, 1658, and three years after, on the 21st of June, 1661, converted into a treaty of peace at Kardis, by which their former possessions were mutually secured to each party. A peace had also been concluded between Poland and Sweden, in 1660, at Oliva; but before its conclusion, the war between Russia and Poland had been renewed: this war, too, was occasioned by the Cossacks on the Dnieper, who had revolted from Russia, and sought protection from the Poles. Although the Russians were defeated in several battles, the issue of this war was quite as advantageous to them as that of the former contest with Poland; for in the thirteen years' armistice concluded at Andruszow in 1667, Russia gained, in addition to former conquests, that part of the Ukraine on the other side of the Dnieper of which she had already got possession.

Immediately after the conclusion of tne Polish war, a formidable insurrection broke out among the Don Cossacks. Stenko Razün, a Cossack, resented the death of his brother, who had been executed by order of a Russian general, and seduced his countrymen to revolt: they burnt and devastated the country from the lower Wolga to Jaik, took Astrachan, in 1670, (where Stenko ordered the Woiewod Prosorowskoy to be thrown over the walls,) and several other cities.

Hopes were held out to Stenko which prevailed on him to present himself at Moskwa, where he was executed as a traitor and rebel: after this, tranquillity was easily restored among the Cossacks. Alexei's last war was against the Turks. Led by their hetman DOROSENSKY, the Saparogian Cossacks had revolted against the Poles, and made a treaty of alliance with Mohammed IV., receiving from him the province of Ukraine in fief. From this cause naturally arose a war between the Poles and the Turks; and Russia was not slow in interfering. Her ambassador Miloslowskoy was ordered to expostulate in behalf of the Poles, and moreover to demand that Azow, which originally belonged to Russia, and in 1642 had been taken from the Cossacks by the Turks, should again be ceded to Russia. But Mohammed's success did not dispose him to listen to the demands of Russia: he took the Polish frontier fortress Kaminieck, conquered the whole of Podolia in less than two months, and alarmed the Russians by the rapidity and success of his operations. The King of Poland, Michael, drew no advantage from the victory over the Tartars gained by Sobiesky at Kaluszo on the 18th of October, 1672, but made a hasty peace which was disgraceful to his country. This peace would have encouraged Mohammed to resist the claims of Russia even if well founded, and of course it emboldened him to resist her claim to Azow; nay, he went farther, he even expected Alexei to cede to him Russian Ukraine. But the King of Poland's peace was rejected by the Polish diet, and Alexei was glad to assist even a constitutional power in renewing hostilities against the formidable Turks. At first he carried on the war with great vigour, but finding the Poles not so ready, as he had expected, to agree to certain ambitious schemes, according to which the crown of Poland was to be settled on his descendants, his zeal abated, and he died, before a peace with the Turks was concluded, on the 10th of February, 1676, in his 46th year.

The most impartial and best-informed writers agree in representing Alexei Michâilowitz as a man endowed with more than ordinary talents and a clear understanding: his private character exhibits many amiable traits. Alexei set at large the Danish count, Waldemar Christian Gyldenlöve, who, since the year 1644, had been kept under arrest as a prisoner of state by the Tzar Mich. Feodorowitz. The count being betrothed to one of the daughters of this emperor, Irina Micháilowna, and having arrived in Moskwa to celebrate the marriage, he was, contrary to original stipulations, required to change his religion. Upon this he disguised himself and attempted to escape from Moskwa, but was discovered, and kept confined till the Tzar Michael's death.

Alexei Michâilowitz did much for the improvement of Russia; agriculture and manufactures were constant objects of his solicitude: he invited many foreigners to Russia, especially mechanics, artists, and military men, whom he treated liberally. He ordered many works, particularly on applied mathematics, military science, tactics, fortification, geography, &c., to be translated into Russian, and when he found that the plates could not be re-engraved in Moskwa, he bought a number of original copies in order to take the plates out of them and insert them in the translations: he enlarged the city of Moskwa and built two of its suburbs. Before his time Russia had hardly any coinage of her own: a small head of a Tzar was usually stamped on foreign coins, which made them Russian and gave them currency; he was the first who coined silver rubles and quarter rubles. He commenced ship building and the construction of harbours in the Euxine and the Caspian, and raised the trade of Astrachan to a flourishing condition. Alexei likewise completely reformed the Russian laws. A committee of five was ordered to make abstracts of existing Ukases, of the decisions of the Boyar Courts, of such Greek laws as might be applicable in Russia, to compare these with the Sudébnik, (a more ancient code compiled under Iwan Wassiliewitz in 1542;) and lastly to add new enactments for cases till then undecided: this is the origin of Alexeis Sobórnoie Uloshénie (Universal Code) which was read before the emperor in October, 1649, and in the same year printed and promulgated. One of the most liberal enactments of this code prohibits '*free* peasants to sell themselves, or to enter into a contract by which they would become *glebæ adscripti*.' The same code contains a curious law relative to snuff and tobacco. 'No man, whether a native Russian or a foreigner, shall dare to have any kind of tobacco about him, or smoke it, or traffic in it: if convicted of transgression, the first time, he is condemned to certain severe corporal punishments and knowting besides; a second time, he shall again suffer knowting, and his nostrils shall be cut open, or his nose cut off, and he shall be sent away to a distant part of the empire.' This law is now by no means strictly enforced, yet the Russians still have a great aversion to smoking tobacco.

Alexei moreover commenced and partly effected an extensive ecclesiastical reform, chiefly in matters concerning the liturgy. [See RASKÓLNIKI and STAROWERZI.] This emperor was twice married: his first wife was Maria Iljinishna Miloslawskoy, by whom he had five sons, (two of whom, Feodor Alexeiewitz and Iwàn Alexeiewitz, were his successors on the throne of Russia,) and seven daughters. His second wife was Natalia Kirillowna Narishkin, by whom he had one son, Peter Alexeiewitz, (Peter the Great,) and one daughter, Natalia Alexeiewna.

ALEXEI PETROWITZ, the eldest son of Peter the Great of Russia, and of Eudoxia the first wife of that monarch. He was born at Moscow, in 1695. From his boyhood Alexis showed a headstrong disposition, and an inclination for low pleasures, which, as he grew up, assumed the character of a decided aversion and opposition to that reformation of the ancient manners of the country which it was the object of Peter's life to effect. It was in 1716, however, while the Tzar was absent on his second tour through Europe, that the prince may be said to have first thrown off his allegiance, by secretly quitting Russia, and taking flight to Vienna, from whence he some time after retired to Naples. Peter, having returned from abroad, foresaw the confusion and mischief which this conduct in the heir apparent might eventually occasion, and went to work with his usual energy to counteract and defeat a plan which threatened the destruction of whatever he had done for the improvement of Russia. It was some time before he succeeded in discovering his son's retreat; but having at length learned where he was, he gave instructions to some noblemen, who proceeded to Naples, and induced the prince to return to Russia, and to solicit his father's forgiveness. The determined character of Peter's extraordinary mind now displayed itself with fearful sternness. As soon as he had secured the person of his son, he proceeded to treat him as a criminal. Being deprived of his sword, he was brought before an assembly of the clergy and nobility, and there compelled to execute a formal resignation of his pretensions to the crown. At the same time, effectually to crush the sedition of which he was the head, his principal partizans were all arrested, and some of them put to death. His mother was shut up in a monastery. But all this was not deemed enough. The prince himself was finally brought to trial, and condemned to suffer death. This was in the year 1718. The day after he was informed of his sentence, Alexis was found dead in prison, and it was given out that he had been carried off by some natural illness; but suspicions have been naturally enough entertained that a private execution accomplished the end, without incurring the risks or inconveniences, of a public one. The prince, whose unhappy career was thus terminated, left a son, a child of three years old, who in 1727, on the death of Catharine I., became emperor under the title of Peter II. He only reigned for three years. After the death of Alexis, Peter declared his second son his heir, but he also died soon after, to the great grief of his father. These events opened the succession to the empress, who, on the death of her illustrious husband in 1725, assumed the title of Catharine I.

ALEXIS COMNE'NUS I., Emperor of Constantinople, ascended the throne in 1081. The Comneni were a family of Italian origin transplanted into Asia Minor. Isaac Comnenus I., whose father Manuel had served the empire with distinction, was elected emperor in 1057, by the troops, in opposition to Michael VI. Isaac having abdicated two years after, and his brother John having declined to succeed him, the imperial purple was assumed by Constantine Ducas, a friend of the Comneni. After several reigns interrupted by revolts, Alexis, the third son of John Comnenus, was raised by the soldiers to the throne, from which his predecessor, Nicephorus Botaniates, himself a usurper, was hurled down, and forced to retire into a monastery.

Alexis assumed the reins of the empire at a critical moment: the Turks had spread from Persia to the Hellespont, the frontiers of the Danube were threatened by swarms of barbarians; the Normans, who were masters of Apulia and Sicily, attacked the provinces on the Adriatic; and, to crown the whole, the first crusade came with its countless multitudes, threatening to sweep away the eastern empire, and Constantinople itself, in their passage. 'Yet, in the midst of these tempests, Alexis steered the imperial vessel with dexterity and courage. At the head of his armies he was bold in action, skilful in stratagem, patient of fatigue, ready to improve his advantages, and rising from his defeat with inexhaustible vigour. The discipline of the camp was revived, and a new generation of men and soldiers was created by the example and the precepts of their leader. In a long reign of thirty-seven years he subdued and pardoned the envy of his equals: the laws of public and private order were restored, the arts of wealth and science were cultivated, the limits of the empire were enlarged in Europe and Asia, and the Comnenian sceptre was transmitted to his children of the third and fourth generation.'—Gibbon's *Decline and Fall of the Roman Empire*, ch. xlviii.

The most important event of Alexis' reign is the passage of the crusaders through his dominions. His conduct on that occasion has given rise to the most conflicting statements by various historians. Alexis had solicited some assistance from the western princes against the invading Turks, but he was alarmed at the approach of hundreds of thousands of undisciplined and riotous fanatics led by Peter the Hermit, who ravaged the Christian countries on their way with as little scruple as if they had been Mohammedan. This promiscuous multitude, however, was safely passed by Alexis's care across the Bosporus into Asia, where they were drawn by the Turks into the plains of Nicea, and there destroyed, in 1096. The regular part of the expedition came after in several divisions, under the command of Godfrey of Bouillon, of several French princes, and of Bohemond and Tancred, son and nephew to Robert Guiscard, the Norman conqueror of Sicily. After a long and painful march, the crusaders encamped under the walls of Constantinople. Alexis supplied them with provisions, but carefully guarded the city against any surprise on their part. Frequent affrays, however, took place between the Franks and the Greeks, who looked upon their unwelcome guests with as much fear and aversion as they did on the Turks. The leaders of the crusaders were admitted to the imperial presence, where they paid homage to Alexis, who found means to tame and to conciliate the rude chiefs by gifts, and by promises of assistance in their expedition to the Holy Land, while he induced them one after the other to pass quietly over to Asia. This being accomplished, Alexis assisted them in the capture of Nicea from the Turks, which conquest, however, he kept for himself. In the same manner he profited by the progress of the crusaders, following as it were in their wake, and reconquering from the Turks all the coasts of Asia Minor and the neighbouring islands, and driving the Turkish sultans into the interior to the foot of Mount Taurus. While intent upon this, Alexis neglected or forgot to lend any further succour to the crusaders, who were fighting on their own account in Syria and Palestine. The Latin historians therefore accuse him of bad faith, whilst his daughter, Anna Comnena, who wrote her father's life, extols his wise policy, dwelling with haughty indignation on the insolence and rapacity of the western barbarians. The Byzantine Greeks were a refined, but effeminate and corrupt race; cunning, suspicion, and dissimulation were their principal weapons of defence against the headlong violence of the feudal semi-barbarous Franks. Alexis died in 1118, and was succeeded by his son John Comnenus, a good and wise prince His other son Isaac was the father of another John, who apostatized to the Turks and married their sultan's daughter, and through whom, apparently, Mahomet II., centuries after, boasted of his Comnenian descent; and of the famous Andronicus, who, after a most adventurous career, usurped the throne in 1183, causing his relative, the youthful heir, Alexis Comnenus II., to be strangled, together with his mother Maria, the Emperor Manuel's widow. Andronicus was himself overthrown and put to a cruel death three years after, and in him ended the imperial line of the Comneni on the throne of Constantinople. Andronicus' posterity reigned afterwards over the province of Trebizond, with the pompous title of emperors. (See the various *Histories of the Crusades*, and the collection of the *Byzantine Historians;* and particularly the *History of* ANNA COMNENA.)

ALFIERI (VITTORIO), was born at Asti in Piedmont, in January, 1749, of a noble and wealthy family. He lost his father when a child, and his mother having married again, young Vittorio and his sister Julia were placed under the guardianship of their uncle, Pellegrino Alfieri. Another uncle, Count Benedetto Alfieri, was the well-known architect who built the king's theatre at Turin, and other public and private structures. Vittorio at nine years of age was sent as a boarder to the *academy*, or college of the nobles at Turin. He gives in the memoirs of his own life a very unfavourable description of the method of education which then prevailed in that and other institutions of the same kind. He went through the courses of Latin grammar, humanities, and rhetoric, all in Latin, learning by heart passages of the classics without knowing any thing of ancient history or geography. Italian grammar did not form part of his studies, and he was left to understand Italian books as well as he could. He was, moreover, a sickly boy, of shy manners, self-willed, and impatient of control. At the age of thirteen he was admitted to study philosophy in the University of Turin, and of this course he also gives a very amusing description. The lectures were in Latin, with which Alfieri, notwithstanding his three or four years' schooling, was not very familiar. The morning lectures were on geometry, and such was his progress, that he never could understand Euclid's fourth proposition. The afternoon lecture was devoted to logic and metaphysics, 'when the students, wrapped up in their mantles, used to fall regularly asleep, while the professor, half-dozing himself, went through a Latin explanation of his subject in a languid, monotonous tone of voice, which was now and then interrupted by some one of his audience snoring louder than the rest.' Thus passed the first year of philosophy; in the following, he studied physics to very little better purpose; he next passed on to civil and canon law, but his health would not allow him to continue his course, and he contented himself with the degree of Master of Arts, after going through a sort of examination by the help of his good memory, the assistance of a tutor, and the easy indolence of the examiners. He had, at the same time, private teachers of geography, which he liked very well; of music, in which he made little or no progress; of fencing and of dancing, which latter he absolutely detested, as well as the French master who taught him. He attributes to the appearance of this man his first unfavourable impressions of the French in general, which he says were strengthened by seeing the Duchess of Parma and her maids, on their passage through Turin, all besmeared with rouge, which was not then used by Italian ladies. Of one exercise he was passionately fond, and this was riding, which served materially to improve his health. He still continued to live in the academy, but under much less restraint; at the age of fourteen, by the laws of Piedmont, he was master of his own income, and only subject to his guardian in so far as he could not alienate his property. He then entered the army, as all young noblemen were bound to do, with the rank of ensign in a provincial regiment, which in time of peace only assembled for a few days twice in the year.

At the age of seventeen he obtained the king's leave to travel under the escort of an English Catholic tutor. He went first through Italy, and having got rid of the tutor, next proceeded to France, where he was introduced at the levee of Louis XV., at Versailles. He was struck with 'the Jupiter-like superciliousness of that monarch, who stared at the persons introduced to him without condescending to say a word to them.' Alfieri's pride (and he had a considerable share of it) was evidently hurt. From France he came to England, with which country he was pleased from the first. He admired 'the general appearance of comfort, the life and activity of the people, the neatness and convenience of the houses, tiny as they appeared to him coming from Italy, the roads, the inns, the horses, the women—every thing.' Contrary to the common supposition, he found a greater facility of introduction into company to a foreign gentleman well recommended in London than at Paris. After spending in England the winter of 1768, he crossed over to Holland, which country he liked best next to England. He attributed the advantages of both to their institutions, and the long habit of rational freedom. In Holland Alfieri began his love adventures, which he followed with all the madness of a southern temperament. His life was, for several years after, restless and dissipated; he ran from Holland to Italy, thence to Vienna, to Berlin, to Denmark, Sweden, Russia, and thence through Germany and Holland, back again to England in 1771, when he had an intrigue, not very creditable to him, with a married lady, and fought a duel with her husband. He afterwards went to Spain and Portugal, and thus completed his tour of Europe. He has written an account of his travels in his *Satire*.

In 1773 he returned to Turin, where he took a house, and apparently settled. There, in the midst of another love intrigue, and after having recovered from a severe illness, he began to write some scenes of a drama on the subject of Cleopatra. This was his first essay in Italian versification. He next wrote, in French prose, two tragedies, Filippo and Polinice. At last, dissatisfied with these essays, he resolved on removing to Tuscany to study the pure Italian language. In 1777 he went first to Siena and then to Florence, where he applied himself seriously to dramatic composition. He there also made the acquaintance of a lady who fixed his heart for ever. This was the wife of Charles Edward Stuart, called the Young Pretender, (see ALBANY, COUNTESS OF,) at whose house most foreigners visited. The lady afterwards separated from her husband, and retired into a convent at Rome. Alfieri continued attached to her, and followed her to several places; at last, after her husband's death in 1788, it appears that they were privately married, although the marriage was never made public, and by some is doubted.

In 1782 Alfieri had completed fourteen tragedies, ten of which were printed at Siena. Though he paid little attention to the strictures of the purists, he answered a long letter of Calsabigi, in which the latter had criticised his work with some show of reason. After this we find Alfieri starting again for England in the autumn of 1783, for the sole object, as he informs us, of buying horses. After spending a winter in London, he set off, on his return to Tuscany, with a retinue of fourteen horses. He describes in a humorous style the trouble he had in leading his cattle across the Channel, through France and over the Alps, not then so practicable as now, into Italy. In 1785, the Countess of Albany having gone to live in France, Alfieri also repaired thither, and resided first at a villa near Colmar, and afterwards in Paris, where he superintended the edition of his tragedies, by Didot. Soon after he published his other miscellaneous works at Kehl. Alfieri and the Countess were living quietly at Paris, when the French revolution drove them away. He was present at the tragedy of the 10th of August, 1792, after which he hastened to get passports for himself and the lady; but on coming out of the city they were stopped at the barrier by a squad of *sans culottes*, who, seeing two travelling carriages and servants, wanted to stop them, saying they were aristocrats running away, and to lead them to the Hôtel de Ville. Had this taken place, the probability is, that both Alfieri and the countess would have perished in the massacres of the subsequent September. Alfieri, however, by showing a bold countenance, vociferating as loud as the French themselves, swearing he was a foreigner, an Italian, and appealing to the seven passports which he held in his hands, after half an hour's altercation came clearly through the barrier. Two days after their departure the municipal officers repaired to the house of the Countess, seized her furniture, Alfieri's horses, books, MSS., &c.; and their property in the funds was sequestered, under the plea that they were emigrants.

Alfieri and his companion hastened through Belgium and Germany back to Florence, from which city he never stirred after. Here he wrote his *Misogallo*, a collection of satirical sonnets, letters, and epigrams, in which he has embodied all his early prejudices and his more recent feelings of dislike to the French people. It is a work of undiscriminating passion. At forty-six years of age he began studying Greek, and by his own unassisted application he was enabled in two years to understand and translate the Greek writers. In 1799 the French troops entered Florence, but remained there only a few months, which Alfieri spent at a country seat, to avoid the unpleasant scenes of military violence. He afterwards lived quietly at Florence, seeing nobody except the Countess and his old friend the Abbate Caluso, till 1803, when an attack of the gout, to which he was subject, added to his constant application and an extremely sparing diet, terminated his life on the 8th of October, at the age of fifty-five. He expired without much pain, his constitution being evidently worn out. The Countess of Albany was by his side in his last moments. He was buried in the church of Santa Croce, the Florence Pantheon, where many years before the sight of Michael Angelo's mausoleum had inspired him with a desire for literary fame. The Countess of Albany had a fine monument raised to him by the celebrated Canova.

Alfieri gave to Italy the first tragedies deserving the name. The unities are strictly preserved, the characters are few, the action one, no by-play or subordinate incidents; and yet, notwithstanding all this meagreness, there is so much power in the sentiments, so much nervousness in the language, such a condensation of single passion, that the performance of one of Alfieri's tragedies keeps the audience as spell-bound. Such, at least, is the effect they produce upon an Italian audience.

The "Saul" is the finest of Alfieri's plays; the author has imparted an oriental and biblical colouring to the language and the situations of his personages, which, together with the fine lyric passages expressive of the changes in Saul's mental alienation, give a peculiar, an epic interest, to this play. The "Filippo" is considered as the next in merit. Most of the others are on Greek and Roman subjects. Two are taken from the history of Florence,—*La Congiura dei Pazzi*, and *Don Garzia*, the son of Cosmo I., Grand Duke of Tuscany. A. W. Schlegel, of Bonn, in his 'Course of Dramatic Literature,' has given copious strictures on Alfieri's plays, which have been replied to by Gherardini, in his notes to the Italian translation of the professor's work, in which the reader may find all the arguments for and against the Italian tragedian. Alfieri's classic drama is very different from that of the French stage; it is chiefly distinguished by its extreme simplicity, the absence of all superfluous declamation and tedious narrative, and the exciting abruptness of his blank verse. This arrangement of words, which has been called harsh, was by him purposely studied, to supply the deficiencies of the measure.

Of Alfieri's minor works several have been already mentioned in the course of this article. He wrote six comedies, four of them on political subjects, being satires on the various systems of government, 'the One,' 'the Few,' the 'Too Many,' and the fourth is 'the Antidote, a mixture of the Three Poisons.' Among his prose works the *Tirannide* is a vehement invective against tyranny, taken in the old and extreme sense of Machiavelli's *Principe*. But such a government as Machiavelli saw before his eyes in several Italian states when he wrote, existed no longer in any part of Christian Europe in the days of Alfieri; hence the sketch of the former has all the thrilling vividness of a portrait from life, whilst that of Alfieri is taken from books and his own excited imagination. His translation of Sallust is very much esteemed. Alfieri's abhorrence of the excesses of the French during the first revolution, and of their subsequent servility under military despotism, has caused some to imagine that he had renounced all his liberal ideas before his death. But this is a superficial view of things. A man may admire liberty, and yet be indignant against those who prostitute its name by crimes. Alfieri's idea of liberty was inseparably connected with that of order and security for persons and property, and he saw the latter violated every day both in France and in Italy. His violent temper led him sometimes into paradox and seeming contradictions. But he was, upon the whole, an independent, candid, honest-hearted writer; and his example and his precepts gave a temper to the Italian mind which has not been lost. He formed a moral school, not numerous indeed, but including some of the brightest names in Italian literature of the present age. His name is ever mentioned by the Italians with respect. He kept aloof from those attacks and sneers against religion and decency, in which weaker minds indulged in his time; on these points he gave no scandal to his Christian brethren. In his private character he was a warm and constant friend, and a man of honourable sentiments and conduct. Alfieri's works have gone through many editions, both separately and together in one collection. Two editions of the latter were published,—one at Pisa, in 1808, in 22 vols. quarto; and another at Padua, 1809-10, in 22 vols. octavo. His tragedies, his autobiography, and some of his minor compositions, have been published in the Milan collection of the Italian classics, under the title of *Opere Scelte*, in four volumes octavo, 1818; and this is the most correct edition of that part of his works. (See *Vita di Vittorio Alfieri da Asti, scritta da esso.*)

ALFONSIA. [See ELÆIS.]

ALFONSO V. of Aragon, and I. of Sicily, succeeded, in 1416, his father, Ferdinand I., who had annexed the crown of Sicily to that of Aragon. To these two Alfonso added that of Naples. Queen Joanna II. having adopted him for her heir and successor, Alfonso repaired to Naples, but was driven away by the party of the Angevins, headed by the famous Sforza Attendolo, and the queen was compelled, in 1423, to name as her successor, Louis III. of Anjou. At the death of Joanna, in 1435, Alfonso renewed his claims, but was opposed by René of Anjou, who after Louis's death had been called to the throne by the last will of the queen. The court of Rome declared for René. Alfonso's fleet was attacked near the island of Ponza by the Genoese who had taken René's part, and was totally defeated, Alfonso himself being taken prisoner. The Genoese sent him to Philip Maria Visconti, Duke of Milan, who was then also lord of Genoa. Alfonso found favour with his keeper, who was pleased with his acuteness of mind and his superior address, and who, being also jealous of the French dominion at Naples, not only restored him to liberty, but made an alliance with him. Alfonso repaired to Gaeta, which his fleet had taken by surprise, and thence he went into the Abruzzi and Puglia, where he found partisans among the nobility. The war between him and René was carried on in those remote provinces for several years, till at last the treachery of the younger Caldora, a condottieri chief, ruined the affairs of René, and Alfonso advanced against Naples in 1442. His soldiers entered the city through an old aqueduct, and René escaped by sea to Provence, where he reigned till his death, the last king of the house of Anjou. Alfonso now fixed his residence at Naples, and for the first time since the Sicilian vespers, Sicily and Naples were united under the same monarch. Alfonso applied himself to re-establish order and justice throughout the kingdom, which had long been a prey to misgovernment and confusion under the weak and corrupt reign of Joanna II. In order to strengthen himself with the nobles, whose power was very great, he extended their feudal privileges, and he also increased largely the number of the feudatories of the crown. In return he obtained of them in parliament assembled grants of money, or *gifts*, as they were called, and fresh taxes to supply his expenditure. One of these taxes, which was a ducat upon each hearth, was resisted by the concubines of the clergy, at that time extremely numerous in the kingdom, who alleged that they shared in the immunities of the clerical order; until Alfonso, by a circular dated 3rd of February, 1446, charged the bishops with the collection of the tax and the arrears for three years past. This curious document is still to be seen in the archives of Naples. The wide plains of Puglia having been devastated during the preceding wars, and become a desert, Alfonso made of them an immense pasture-ground for the flocks of the neighbouring provinces, and placed the administration under a particular court; the revenues resulting from it fell to the profit of the fisc or crown, and such it has remained, to the present day, under the name of *tavoliere di Puglia*.

Alfonso was engaged in frequent disputes with the popes, which were terminated by the treaty of Terracina in 1443, when he joined the Papal troops against Francesco Sforza, the son of his old antagonist, and dispossessed him of the *marches*. Sforza having afterwards become, first, general, and then duke of Milan, Alfonso joined the Venetians against him and his allies, the Florentines. It has been a subject of reproach against Alfonso, as well as the other Italian leaders of that time, that, instead of relieving Constantinople from the attacks of the Ottomans, they wasted their energies in the petty quarrels of private ambition. Alfonso made a scanty compensation for this neglect, by affording an asylum and assistance to the fugitive Greeks who brought their learning into Italy. The most favourable feature of Alfonso's reign is his patronage of letters. Beccadelli, called Panormita, and Pontanus established the famous academy which took the name of the latter. Panormita wrote a work *De Dictis et Factis Alphonsi;* and Fazio, who was secretary to the king, wrote also commentaries *De Rebus gestis ab Alfonso I.* The learned Valla was for a time at the court of Alfonso. The study of jurisprudence was particularly encouraged by the same monarch. Paris de Puteo and Gian Antonio Carafa, two celebrated jurisconsults, were both his councillors. He collected a splendid library at a great expense, and caused translations to be made from the Greek of the works of Aristotle, Xenophon, &c.

Alfonso was fond of the arts, and to him Naples owed several embellishments: he first caused the streets to be paved with large flags; he restored the aqueducts which supply the fountains with water, and drained the neighbouring marshes which infected the atmosphere. He enlarged the mole and the arsenal, and raised the fine triumphal arch which forms the entrance of the Castelnuovo, which was then the king's palace.

Under Alfonso both Naples and Sicily, so long distracted by internal feuds, civil wars, and foreign invasions, enjoyed a period of tranquillity, and his grateful subjects styled him the Magnanimous, whilst the men of letters whom he protected called him the Wise.

Alfonso had no legitimate children, having early separated from his wife, owing to her intemperate, though not ill-founded jealousy. By his various mistresses he had but one son, Ferdinand, to whom he was fondly attached. In order to secure him at least one of his several kingdoms, he assembled a parliament in 1442, and by making large concessions to the barons, induced them to declare Ferdinand, Duke of Calabria and heir to the crown. Next day Alfonso invested his son at the altar with the ducal crown, and the barons did him homage. The pope had already granted Ferdinand a bull of legitimacy. Alfonso's brother, John, remained heir to the crowns of Aragon, Valencia, Sardinia, and Sicily. This John was afterwards succeeded by Ferdinand called the Catholic, who reconquered the kingdom of Naples, which continued to be a dependency of Spain for several centuries.

In 1457 Alfonso sent a fleet against Genoa, to favour the party of the Adorni faction, which had been exiled; the city was hard pressed by the besiegers, when the news of Alfonso's death released it from danger. The king had attended a great hunting party in Puglia, where he overfatigued himself, and was carried back ill to Naples. After giving his parting advice to his son Ferdinand, recommending him to moderate the taxes, to keep peace with the pope, and to favour his Neapolitan subjects in preference to the Aragonese and Catalonians, he expired on the 17th June, 1458.

ALFONSO II., of Naples, son of Ferdinand I., and grandson of Alfonso I., was the chief cause of the famous revolt of the barons under his father's reign, and of the cruelties that followed. On the death of Ferdinand in 1494, he succeeded to the throne; but the approach of the French, under Charles VIII., frightened him, and he ran away before he had completed one year of his reign. He retired to a convent at Messina, where he practised great austerities, to atone, as he thought, for the crimes he had committed. He died soon after. Ferdinand II., his son, succeeded him, and, with the assistance of the Spaniards, drove away the French; but dying prematurely in 1496, was succeeded by his uncle Frederic, Alfonso II.'s brother. (Guicciardini, *Storia d'Italia;* Porzio, *la Congiura dei Baroni.*)

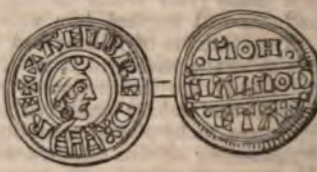
ALFONSOS, of Spain and Portugal. [See ALONSO.]

ALFORD. [See LINCOLNSHIRE.]

ALFORT, a hamlet in France, in the department of the Seine, about five miles south-east of Paris. It is noted for its royal veterinary school, established in 1766, which contains a special library, and a collection of comparative anatomy and pathology. There are accommodations for the sick horses, a botanic garden, chemical laboratory, &c., It is separated from Charenton by the Marne. (*Diction. Géograph.*)

ALFRAGANIUS, properly AL-FARGANI, or with his complete name, Ahmed ben Kothair Al-Fargani, was a celebrated astronomer, who flourished under the reign of the Abbaside caliph Mamun, in the earlier part of the ninth century of the Christian æra. He was called Al-Fargani from his native place, Fargana, a town and province in Transoxiana. We possess an elementary treatise on Astronomy by him, chiefly founded on the system of Ptolemy, which was printed, with a Latin translation and notes, by Golius, in 1669.

ALFRED THE GREAT. This illustrious and excellent king was born in the year 849, at the royal manor of *Vanathing*, (Wantage,) in Berkshire. Anglo-Saxon writers, and among these the king himself, commonly write his name Ælfred, and this orthography is frequently followed on ancient coins: in some instances, however, as in the one copied below from a coin in the British Museum, the name is written Aelfred: in other writers, and indeed on some coins too, we find ЄLFRED. Gibson, in his edition of the *Saxon Chronicle,* reads Ælfred throughout. Norse (*i. e.* Icelandic) writers invariably write this king's name Alfredr, the final *r* being a short syllable forming the nominative termination which is pronounced *ur*.



Alfred's lineage was ancient and illustrious: on the father's side, Anglo-Saxon authors count twenty-two generations from him up to Woden, (*i. e.* Odin.) Alfred's father was Ethelwolfe, and his grandfather Egbert, both kings of the West Saxons; his mother was Osburgh, a daughter of Oslac, who, although only a butler to king Ethelwolfe, was still descended from renowned Gothic progenitors, and was by his son-in-law raised to an earl's rank. Ethelwolfe had four sons lawfully begotten—Ethelbald, Ethelbert, Ethered, and Alfred; and one illegitimate son, Athelstane. Alfred being the youngest of Ethelwolfe's legitimate issue could entertain but small hopes of succeeding to the crown; and it appears, therefore, the more surprising that when in the fifth year of his age (A.D. 853) he was sent to Rome, he received royal inaugural honours from Pope Leo IV. There seems, however, no reason to doubt this fact: the explicit words of the Saxon Chronicle are: 'þa væs þonne Leo Papa on Rome, and he hine to cyninge gehalgode,' (at that time Leo was pope in Rome, and he consecrated him king.) The assertion of Asser, Alfred's friend and councillor, is equally clear, and it is supported by many other authorities. Alfred's journey to Rome certainly gave a considerable impulse to his inquiring mind.

Asser laments the neglect of Alfred's early education, and states that he 'remained *illiterate* till his twelfth year or longer.' We apprehend that the best educated princes in Europe of the ninth century remained illiterate considerably beyond that age. Examining the whole passage more attentively, (p. 16, Wise's edition,) we find that Asser probably used the term 'illiteratus' in a very restricted sense, *i. e.* for one unacquainted with *Latin*. He states, that his noble mind thirsted for knowledge from the very cradle; that he took delight in listening to Saxon poems, and got them by heart; and that when his mother offered to her sons a book of Saxon poems as a prize to him who first should learn them, Alfred instantly went to his tutor, read the book, and repeated its contents to his mother. Asser, as a Welshman, seems to have accounted *Saxon* learning for nothing; as a priest, he doubtless affected to hold up Latin as the only orthodox vehicle of knowledge. But, turning our attention to Alfred's subsequent life and occupations, we must feel inclined to give him credit for earlier acquaintance with Latin than his biographer has done. The works of this prince show that at some time or other he must have acquired a knowledge of Latin which, for a prince, in Alfred's age, was almost miraculous. In his youth and manhood we find him so occupied that we must admit that unless this knowledge was acquired early, it would be unaccountable how he could acquire it at all: and the style of his works in his native language shows that his acquaintance with classical models was familiar, and extended to more than mere words and phrases—he had imbibed the spirit of the authors of Greece and Rome.

But in his unremitting pursuit of knowledge Alfred did not neglect those accomplishments which the age admired, and which its habits and mode of life rendered indispensable; he was expert in hunting and shooting, and early accustomed himself to endure fatigue and occasional abstinence from food; and even in his youth he distinguished himself in successful conflicts with the numerous bands of foreigners who at this period so frequently invaded the English coast.

The enemies with whom Alfred had to contend were DANES. By this term ought to be understood all the Scandinavian nations, viz. Danes, Swedes, and Norwegians indiscriminately, who, because they at that period spoke a common language, the *Norse*, (then called *Danish*, or Dönsk Tunga, in foreign countries,) went by the appellation which, strictly speaking, was peculiar to the most powerful of the Scandinavian tribes. Many reasons, indeed, make it probable that the invaders on the English coasts in Alfred's time were chiefly Norwegians, and not *Danes*, in the strictest sense of that word. Danish invasions commenced nearly a century later, and ended in final conquest. English chroniclers, Matthew of Westminster and others, who mention Rolf the Walker's invasion, call him and his followers *Danes;* and yet it is well known that he was a Norwegian nobleman: and although we cannot identify the names of other chieftains with those known in Norwegian any more than with those known in Danish history, it still is more probable that they chiefly belonged to the former nation.

The Scandinavian nations of this period cultivated war as a favourite science. Their other acquirements and talents, even the literary (and these were not inconsiderable) were made subservient to it, and were valued in proportion to the degree in which they contributed to its advancement. The constant themes of the poets were the warlike exploits of eminent chiefs; and history recapitulated in prose the subjects of the songs of many a bard. In the ninth century the Norwegians seem to have surpassed all other European nations in bravery and warlike spirit. So great was the fame they had acquired, that subsequently they were hired in considerable numbers by the Byzantine emperors to fight against their Asiatic and African enemies. It is essential in Alfred's history rightly to appreciate the character of the enemy with whom he had to contend; for it has been grossly misrepresented by the monastic writers, and consequently Alfred's merit lowered much below its true standard. We can only do justice to Alfred by bearing in mind that he had to defend his dominions against the incessant attacks of the most accomplished warriors of the age, in which he displayed such skill, perseverance, bravery, and prudence, as must secure to him a high place among military commanders.

Frequent as foreign invasions had been during the reign of Ethelwolfe, as well as during the two subsequent reigns of Ethelbald and Ethelbert, they became particularly formidable at the commencement of the reign of Ethered, (866,) when Alfred was eighteen years of age. At this early period Alfred seems to have been his brother's most valuable general. In this year the foreign army invaded East Anglia, but after obtaining horses from the inhabitants, they made peace with them, and committed no further depredations. The year following they sailed up the Humber to York, and took that city after a bloody battle with the Northumbrians, in which the two rival kings, Osbryht and Ella, who had united their forces against the invaders, were slain. In 868 the invaders marched on to Nottingham in Mercia, when the Mercians besought Ethered and Alfred to come to their assistance; the brothers instantly marched with the West Saxon army, but after a skirmish with the foreigners the Mercians chose to treat with them. During the two following years the exploits of the invaders were confined to Northumbria and East-Anglia; they killed Edmund, the king of the latter, in a bloody battle; in the former they plundered a wealthy monastery called *Medeshamstede*, (now Peterborough,) and slew the abbot and all the monks.

In 871 the foreigners invaded the kingdom of the West Saxons, and in this one year, besides many minor battles which Alfred fought at the head of small bands, there took place altogether *nine* great battles between the invaders and the West Saxons. At Inglefield the latter were victorious, at Reading the former; at Æscesdune (Aston or Ashendon) the West Saxons gained a great victory against the kings Bagsæc and Healfdene, of whom they slew the former, along with five earls. This victory must be mainly considered as Alfred's. He bravely attacked the enemy, while Ethered, on his side, deferred the engagement for the sake of hearing mass. A fortnight after this battle the West Saxons were in their turn defeated at Basing, and two months later also at Mereton, where the bishop Heamund was slain. Ethered died shortly after Easter in this year, and Alfred succeeded to the crown, being twenty-three years of age. A month after his accession, though his forces were greatly reduced, he was with a very small army compelled to a general engagement at Wilton with the whole army of the invaders: in the earlier part of the day he routed the enemy, who, however, being much superior in numbers, at last kept the field. After this victory, no further encroachment on Alfred's territory seems to have followed immediately. It may be supposed that the bloody victory of Wilton had so much weakened the invaders, that they for a time abstained from offensive warfare against the most valiant as well as most powerful of the Saxon princes: but still they remained in England, and during the three following years consolidated and recruited their power by more successful wars against other English rulers. In this interval they overran and occupied Mercia and Northumberland. After so many bloody battles Alfred's army was greatly reduced, and he was well aware that he could not now take the field with advantage. Still he was determined to leave nothing untried which might harass the enemy. The pressure of circumstances—the very inability to bring an effective army into the field—first suggested the idea, which ultimately proved so salutary, of fitting out a fleet.

For this true account of the origin of the English fleet it would be fruitless to look in any *History of England;* but an attentive reader of the *Saxon Chronicle* will nevertheless find it confirmed by the facts there stated. Extraordinary distress first suggested the idea of the 'wooden walls;' and it is remarkable, that Alfred, being placed in such embarrassing circumstances, became the first founder of that naval power which in subsequent ages was to be an object of the world's dread and admiration. Alfred perceived that he had great advantages in fitting out a small flotilla to act in known seas, and on a dangerous coast, (for most of the invaders landed between the Humber and the Thames,) against invaders ill-acquainted with its peculiar perils. This plan was much more practicable than to fit out an army capable of taking the field against a brave and numerous enemy. So important was this discovery to Alfred, that subsequently, when he was compelled to abscond for a short time, the perpetuation of his reign and the preservation of the West-Saxon monarchy were, in all probability, mainly owing to the existence of this small navy; for by its means alone he so far preserved possession of his kingdom, that it could be said that the invaders still had a fighting enemy within Alfred's domains.

Small as Alfred's fleet was in the beginning, in the first naval engagement his men attacked seven of the enemy's ships; of these they took one and the rest made their escape. Finding that regular battles were not the most advantageous warfare against a leader such as Alfred, the invaders changed their plan; they entered his fortresses by night, and there determined to risk an attack. In 876 they stole into Wareham, but Alfred found means to drive them out, and even obtained hostages as a guarantee that they would immediately leave his kingdom: yet a part of their army soon after entered Exeter in a similar manner. Alfred pursued them to that city, and again bound them by solemn oaths and hostages to evacuate his dominions.

In the year 878, shortly after Epiphany, the invaders entered Chippenham and took possession of it. About this time they must have received considerable reinforcements, although contemporary writers do not mention such a fact; but that Alfred *now* no longer had an effective army, appears manifest, from the expedients and fruitless negotiations to which he was driven. This greatly encouraged his enemies. They now spread over the whole kingdom of the

West Saxons, and for a very short time accomplished a despotic military occupation. Many of the inhabitants fled their country, and sought more peaceable abodes beyond sea. Alfred, with a small troop, was obliged to conceal himself in woods and mountain fastnesses. Neotus, and, after him, Asser, says that he for a time sought refuge with one of his cowherds; who, it seems, so faithfully kept his master's secret, that he did not even tell his wife that the king was their guest. One day, while sitting near the fire pointing arrows and making a bow, she had set him to turn some cakes which she left on the fire: owing to Alfred's neglect the cakes were burned, for which she chid him, saying, that he was 'good at eating cakes, but bad at turning.' Alfred passed the time from Christmas to Easter in a state of concealment and destitution; even in these circumstances he was not entirely inactive, but secretly maintained a kind of correspondence with the most devoted and faithful of his adherents. A foreign chief who during this winter had with twenty-three ships invaded Devonshire, was slain with 840 men, and his standard, called the 'Raven,' was taken. It is extremely difficult to determine how far Alfred was concerned in, or connected with this exploit, but it certainly was performed by his party.

About Easter, Alfred with a few of his friends took possession of a small island situated in the midst of a marsh formed by the stagnating waters of the Tone and Parret in Somersetshire. This island the Saxons, probably from the circumstance here mentioned, called Æthelinga-igge; its modern name is Athelney. This inaccessible place he made still stronger by fortification; and from thence, assisted by his neighbours in Somersetshire, he made frequent excursions against the foreigners, and at Whitsuntide again took the field at the head of a considerable army. At a place to the east of Selwood, called Ecgbyrtes-stane (perhaps Brixton), he was cordially received by the people of Somersetshire, Wiltshire, and Hampshire, and from thence he immediately marched by night to Æthandune (Eddington): here he fought a great battle with the whole foreign army, routed them and pursued them to a strong hold, which he besieged during a fortnight. The invaders capitulated; and Alfred once more accepted four hostages and their solemn oath that they would leave his territory and receive baptism. This last article in the treaty Alfred insisted upon, not so much from zeal for conversion as from fear, which repeated experience had shown to be well grounded, that the difference of religion would make such oaths as he prescribed of no effect. Accordingly the king, GODRUN, and thirty chiefs of his army, were baptized at *Alre*, (Auler,) a place near Athelney; Alfred stood godfather on this occasion, and gave to Godrun the name of Athelstane. Godrun remained twelve days with the king, and when, in order to undergo the ceremony of removing the baptismal chrism (*i. e.* unction) at Wedmore, he left him, he was honoured with magnificent presents. On this, as well as on many other occasions, we may admire in Alfred the rare union of fortitude and moderation, of unshaken firmness and ready forgiveness; which in this instance proved salutary, for Godrun ever after continued his faithful friend and vassal.

During the four following years (879—882) a new swarm of invaders overran several parts of Mercia and East Anglia; but after the victory of Eddington we find Alfred's power, both by land and sea, gradually increasing. In 882 he fought a naval battle, and took four ships from the enemy. In another battle, in 885, he took sixteen ships. He also obtained several victories by land, one, for example, very decisive, at Rochester. Thus, owing to his activity, bravery, perseverance, and success, in 886 he became, by common consent, sovereign of all England; excepting those parts of the north and east of which the foreigners still retained possession. Their tenure had now, however, become exceedingly precarious. Yet there is no record of any solemn formality gone through, or universal homage done to Alfred on this occasion, and probably such did not take place; his title was stronger and better than what could have been thus conferred, for he enjoyed the unbounded confidence of those who acknowledged him as a ruler: they needed his protection more than he needed their submission. A few years interval of peace now followed, which Alfred employed in the most laudable manner: he rebuilt and repeopled many cities which had been utterly ruined during the war: London, in particular, he thoroughly repaired, and appointed the *Ealdorman* (Duke) Ethered to governor. The many admirable civil institutions, laws, and improvements of which Alfred was the author must be assigned to this period, 886—893.

Alfred was not only the first statesman and legislator, but he was also the first scholar in his dominions; this twofold character he supported with astonishing ability. We must admit that it is by no means Asser's intention to magnify Alfred's scholarship, but even from his memoirs we may, in spite of their author, gather the fact, that Alfred vastly exceeded even the most learned of his prelates in scholarlike accomplishments. Asser's simplicity and credulity are somewhat ridiculously manifested in the account he gives of, what he conceived to be, Alfred's first attempt at reading and translating, which the bishop evidently held to be miraculous.

A more formidable invasion than any of those which he had repelled, yet awaited Alfred. The *Saxon Chronicle* commences the recital of events of the year 893 with an unusually solemn and ominous preamble, and calls the invading army 'SE MICELA HERE' (the great army). This army embarked, bringing their horses with them, at Boulogne, and landed in Kent with 250 sail, in the mouth of a river now dry, anciently called LIMINE, (near New Romney,) at the eastward of the Weald. They towed their ships four miles up the river, towards the wood, and there occupied a fortress, situated in a marsh, which was ill defended by a few villagers; from thence they marched on to Appledore. In a short time Hæsten (Norse, Hásteinn) arrived in the mouth of the Thames with eighty ships, and, taking Milton, erected there a fortification. He seems to have been commander-in-chief of the army conveyed in both these fleets. These invaders commenced offensive operations in the following year, and were now joined by the East Anglians and Northumbrians, who broke their allegiance to Alfred. Various causes are assigned for this defection, such as the absence of a governor (for Godrun died in 890); the predatory propensities of the inhabitants, a great number of whom were probably foreigners, who had settled there after their late conquest; and the allurement of Hæsten's fame, who enjoyed the reputation of an eminent leader. The first of these causes is the most probable; and we may add, that a natural bias in favour of those who spoke the same language, and whose laws, manners, and religion were similar to their own, was likely to recommend an alliance with Hæsten to the East Anglians and Northumbrians. But although this double attack from an internal and external foe, at the same time, was most formidable, Alfred was well prepared; and, on this occasion, his high military talents were conspicuously displayed. He neither sought nor avoided a general engagement; but was particularly circumspect in the choice of his position, and pitched his camp in a place where the advantages afforded by wood and water were all in his favour. He kept the enemy in such awe that they chose not to hazard a general engagement more than twice; once, on their first landing, and before Alfred had taken the field with his whole army; and the second time when they left their camp. During the whole time of their stay, they confined themselves to skirmishes, and predatory excursions in small bands; but were generally beaten, either by detachments of the king's army, or by the inhabitants of the towns. Still they had obtained a considerable quantity of booty, and, leaving their camp, attempted to transport it over the Thames, into East Anglia, where their ships were stationed; but the king's army defeated them, and rescued the booty. The invaders, however, remained in a strong position; and the foreigners who had settled in Northumberland and East Anglia gathered a fleet of 100 ships, with which they laid siege to Exeter, and another of forty ships, with which they invaded Devonshire. The king, accordingly, with the main body of his army, marched to Exeter, leaving only a detachment of chosen troops to prosecute the war in Essex. Victory followed his arms in both places: the detachment which he had left in Essex pursued the enemy to Bemfleet, to which place they retreated, it having been fortified by Hæsten. Hæsten being absent, but the place full of warriors, the king's troops besieged it, demolished the fortifications, took every thing of value which they found, captured Hæsten's wife and his two sons, disabled some of the enemy's ships, burnt others, and brought several away either to London or to Rochester. Hæsten's wife and sons, when conducted to Alfred, were instantly released. In victory, Alfred's memory always suggested motives for mercy—never for revenge; and this time he recollected that he had been a godfather to one of

Hæsten's sons, and the Duke Ethered to the other. He dismissed them, not only unhurt, but (respecting their rank in a manner agreeable to the spirit of the times) even honoured with presents. As soon as Alfred with his troops reached Exeter, the enemy retreated to their ships; but, while he was occupied in Devonshire, two main divisions of the invaders united at South Showbury, in Essex, and there erected a fortification. From thence they marched along the Thames and so on to the Severn, and then following the course of that river up to Buttington, were joined by many Northumbrians and East Anglians on their march. Here they were besieged by three of Alfred's chiefs, the Dukes Ethered, Ethelm, and Ethelnoth: the siege continued many weeks; the enemy were brought to the greatest distress by famine, and at last had nearly eaten up all their horses. At length they made a sally on the besiegers, who occupied the eastern bank of the river, but were defeated by the English, who however lost in this battle several officers and men of rank. A part of the enemy saved themselves by flight. Once more they gathered a considerable army out of Northumberland and East Anglia, and assembled at Wirhall, (West Chester,) where they were again besieged; and only left the place when all the supply of provisions around it was consumed or destroyed. They then marched into North Wales, and plundered the country; and from thence over Northumberland and East Anglia, to Mersey. Here they made no long stay, for, in the beginning of winter, they entered the Thames with their ships, which they towed up along that river and the Lea. On the latter stream, about twenty miles from London, they erected a fortification. In the mean time, those whom Alfred had driven away from Exeter had returned to Sussex, and plundered the country about Chichester; the inhabitants of that town attacked them, slaughtered many hundreds, and took some of their ships. The citizens of London marched out against those on the Lea, attempting to dislodge them and demolish their fortification, but were this time defeated (896). During the autumn Alfred had his camp pitched in the neighbourhood of London, in order to protect the reapers while engaged in the harvest.

By the erection of fortresses, coupled with his great vigilance and activity, he compelled his enemies to retreat upon the Severn. In the years 895-897, a severe pestilence raged in England, both among men and cattle; this calamity greatly checked Alfred's military operations.

In 897, the invaders overran Northumberland and East Anglia; and in the same year Alfred had to contend with an enemy of a new description. Some Northumbrian pirates (Spelman says their captain's name was *Sigefert*) fitted out vessels for stealing and robbing along the south coast of England. Alfred ordered vessels to be built exceeding these in length, height, and swiftness; some of them carried sixty oars, and some more: they differed in make from other ships at that time used in the North Sea, and were particularly fit for the service for which they were destined. Near the Isle of Wight a naval engagement took place between the king's ships and the pirates, in which a great number of the latter were killed, and others, who with difficulty had escaped, were afterwards taken and hanged at Winchester. English historians seem not to be aware of any distinction between these pirates and the foreigners who devastated the country during Alfred's reign; yet Alfred's proceeding, as well as the words 'mid *stælhergum*' used in the Saxon Chronicle, show that the age considered the difference between these and the former as very great. When captive warriors were brought to Alfred, he treated them with every mark of respect and dismissed them loaded with presents; but pirates he condemned to ignominious death.

During the two last years of his reign Alfred seems to have enjoyed some tranquillity. He died on the 27th of October, 901, being fifty-two years of age, and having reigned twenty-nine years and six months.

Thus far goes the chronicle of Alfred's reign, or the bare recital of public events in which he acted, for the most part as a leader, and where he always, in respect to talent, knowledge, policy, and character, maintains a lofty supremacy over his contemporaries. Yet we may say that only the less important part of Alfred's history has been handed down to us. The age in which he lived paid almost an exclusive attention to military exploits; the arts of peace were disregarded and held in small esteem, unless, indeed, they were brought to bear upon religious establishments. Thus we find more information respecting monasteries founded, or erected, or repaired by Alfred, such as one at Athelney, another at Shaftesbury, and a third at Winchester, than the towns and castles, which, at his command, and under his direction, were rebuilt and repaired. Yet it is certain that London came into his possession in a ruinous state, and that, in rebuilding a great part of it, he introduced the use of stone and brick; wood being the only material used before his time. He also rebuilt Winchester and many other cities. The most glorious achievement of Alfred's reign, however, was the establishment of a navy. The idea of shipbuilding once conceived, it appears that it was prosecuted with astonishing vigour: he was also encouraged to further exertion by the success which attended his flag on almost every occasion. He was not content to multiply the number of such ships as formerly had been in use; but he introduced also material improvements into naval architecture: 'His ships were not,' says the Saxon Chronicle, 'like the Danish or Frisian ships,' that is to say, they were not like those ships which till that time had been thought the best of those used in the German Ocean; and from the results we may justly infer that Alfred's ships were better. It seems that even in Alfred's time his fleet had so rapidly increased, that it considerably exceeded the number of one hundred sail: it was divided into small squadrons, and stationed in different places off the coast.

Alfred accomplished a task of extraordinary difficulty in the consolidation of his dominions. When he succeeded to the sovereignty of the West Saxons, Mercia, East Anglia, and Northumberland still existed as independent kingdoms. The rulers of these, although in an equal degree exposed to the ravages and depredations of a common enemy, had not the prudence or policy to see the advantage of a uniform co-operative plan of defence, and accordingly they were crushed and conquered in detail The West Saxons alone were ready, when called upon, to defend England: their views were not merely confined to their coasts and boundaries; thus the *Hegemonia* (Leadership) naturally and spontaneously fell into their hands: they became the English Athenians, and Alfred their Themistocles. It was Alfred's object to regenerate the whole Anglo-Saxon nation, and to create a new national spirit; and this, we find, he effected not ostentatiously, but by unwearied political activity: he was in reality the King, the Liberator, the Reformer of all England. He was, however, quite content to be called KING OF THE WEST SAXONS; and probably deemed it childish to provoke disputes by the assumption of an empty title, while at the same time he incessantly laboured, by the most laudable means, to render his title the strongest and best that ever was earned by any sovereign.

Alfred compiled a code of laws for his subjects; but whether any part of these has been preserved, or how much of them is embodied in subsequent codes, cannot now be determined. For the twofold purpose of more effectually administering justice, and at the same time better controlling and keeping in check a turbulent population, now partly consisting of newly settled foreigners, Alfred instituted a census, and divided England into counties: the counties he again subdivided into hundreds, and the hundreds into tithings. Ten neighbouring householders were formed into one corporation, called tithing or freebourgh, who were made answerable for each other's conduct, and over whom a tithingman or headbourgh was appointed to preside. If a person neglected to have himself registered in a tithing he was punished as an outlaw: change of residence required to be notified to the tithingman. The tithings had jurisdiction and adjusted minor differences among themselves; weightier causes were referred to the court leets of the hundred, which were held monthly, and where the vice courts or hundreds judged along with twelve freeholders as assessors or jurors. From this court, again, an appeal lay to the county court, which was held after Michaelmas and Easter, and consisted of the freeholders of the county. Here the bishop presided together with the aldermen. The last appeal lay to the king in council. In what state Alfred found the judicial department, when he began to reform it, may be judged from the fact, that in one year he ordered *forty-four* judges to be executed. 'Le Roy Alfred fist pendre xliv justices en un an tout come homicides, par leur faux judgments.' Asser mentions that he frequently reprimanded the judges for wrong judgments.

In estimating the merits of Alfred as an author and a scholar, we are less astonished at the vast extent of his knowledge, and even at his literary activity, than at the good taste evinced, both in the choice which he made of books for translating, and in the execution of his translations. His diction is classically easy and simple, yet not unadorned. Spelman has furnished the following list of his original works:—

1. An Abridgment of the Laws of the Trojans, the Greeks, the Britons, the Saxons, and the Danes; 2. Laws of the West Saxons; 3. Institutes; 4. A Book against unjust Judges; 5. Sayings of the Wise; 6. A Book on the Fortunes of Kings; 7. Parables and Jokes; 8. Acts of Magistrates; 9. Collection of Chronicles; 10. Manuale of Meditations. And the following of translations:—1. Paulus Orosius's History against the Pagans, six books;[*] 2. St. Gregory's Pastorale; 3. St. Gregory's Dialogues; 4. Bede's History, five books; 5. Boetius on the Consolation of Philosophy; 6. The *Merchen-Lage* (Laws of the Mercians); 7. Asser's Sentences; 8. The Psalms of David. Alfred was an elegant poet, but his compositions in verse are not mentioned here.

Alfred made greater efforts for the advancement of knowledge among his subjects than any prince of the ninth century—even more than Charlemagne. Here, indeed, it would be difficult to find a rival to him among princes of any age or country. His own description of the state in which he found the kingdom, in respect of literary culture, is interesting; and his feeling of his own merits in effecting a change for the better, modestly expressed as it is, is equally so. We read in his circular letter which is prefixed to his translation of 'St. Gregory's Pastorale,' as follows:—'It (knowledge) had fallen in such total decay among the English, that there were very few on the other side of the Humber who understood the common prayers, so as to be able to tell their meaning in English, or who could have translated into that language a Latin passage; and I ween there were not many on this side of Humber who could do so. Indeed there were so few such, that I do not even recollect one to the south of the Thames, at the time I succeeded to the crown. God Almighty be thanked, there are now some holding bishoprics who are capable of teaching.' He invited many eminent scholars from other countries, and corresponded with Bishop *Fulco* of Rheims, whose agency he made use of for engaging scholars in his service. In this way were invited Grimbaldus, Werefrid, Asser, and John the Monk; John Scotus, when exiled from France, being suspected of heresy, found a ready asylum with Alfred. But this king was not an exclusive patron of mere theoretical knowledge; he also encouraged the useful arts, and always gave a favourable reception to mechanics of superior skill.

The common notion that Alfred founded the University of Oxford, is, indeed, unsupported by contemporary testimony: it appears more probable that a monastic school existed there before this time. It is, however, certain that he did much for its improvement; provided the school with better teachers than it had before; and when differences arose among them, went thither in person for the purpose of re-establishing order and harmony. It is a prominent trait in Alfred's character, that his mind was ever open to instruction on any subject: he entertained voyagers and travellers, in order to gather information respecting coasts and countries in his age unknown: this may be exemplified by Other's and Wulfstane's Tour.[†]

Having so many and multifarious occupations, it behoved Alfred to husband his time: being eminently religious, he divided it into three equal parts, allotting one to prayer and pious exercises, the second to business, and the third to sleep and refreshment. He found that sun-dials, which he no doubt had seen in Italy and France, were less useful in England, where the sun is more frequently obscured. He had, therefore, to choose a more certain expedient; and accordingly he had wax-candles made with marks for the hours, and placed in lanterns that they might burn steadily and equally; these he burned night and day, and by the marks in his candles could always tell what o'clock it was.

In outward appearance Alfred was remarkably handsome and graceful, tall, stout, well made, and active, fond of hunting and other bodily exercises, and skilful in mechanical arts; yet he did not enjoy good health. From his early youth he suffered an excruciating inward pain: about his twentieth year a change took place in his malady; but still he suffered severe pain during the remainder of his life. In his twentieth year Alfred had married Alswith, a daughter of Athelred, Earl of Gainesborough, surnamed the Great, and of Adburgh, who was descended from the kings of Mercia. Alswith survived her husband four years. They had two sons:—1. Edward, surnamed the Elder, who succeeded his father, and 2. Ethelward; and three daughters:—1. Athelfled, who married Athelred, a Mercian Earl. This lady inherited much of her father's extraordinary endowments; 2. Athelgeova, who became Abbess of Shaftesbury; and 3. Alfrith, who married Baldwin, Earl of Flanders.

Sources for Alfred's Biography.—The Saxon Chronicle; Asseris Menevensis *Annales Rerum Gestarum Ælfredi;* Matthæi Westmonasteriensis *Flores Historiarum;* Florentii Wigorniensis *Chronicon ex Chronicis;* Gulielmi Malmesburiensis *De Gestis Regum Anglorum, Libri* V.; Ingulphi *Historia Anglorum;* two MS. Lives of St. Neot in the Cotton Library, the one in Saxon, Vespasian, D. 14, the other in Latin, Julius, E. 7.; Spelmanni *Vita Ælfredi*, Oxon, 1678, fol.; Sharon Turner's *History of the Anglo-Saxons.*

ALFRETON, a town in Derbyshire, 14 miles N.N.E. of Derby, and 140 N.N.W. of London. The whole parish contained a population in 1831 of 5691. The inhabitants are engaged in the manufacture of stockings and brown earthenware; or in the neighbouring collieries. At Riddings, within a short distance of Alfreton, are some considerable iron-works, the property of Mr. James Okes, which, in the excellence of their arrangements, and the skill with which they are conducted, are inferior to none in the country. The houses of Alfreton are irregularly built, and some of them very old; the church, a rude, ancient structure, has an embattled tower with pinnacles. At Swanwick, a hamlet in the parish, is a free-school for educating twelve boys and eight girls of Swanwick and Greenhill Lane, endowed in 1740, by a Mrs. Turner.

There is a weekly market on Friday, chiefly for grain; and two fairs, one in July; the latter, a statute fair, in November. The living is a vicarage in the gift of the Morewood family.

ALGÆ is the name given by botanists to the tribe of plants which comprehends the sea-weeds, lavers, and fresh-water submersed species of similar habits. In structure they vary through a vast variety of intermediate gradations from the state of simple microscopic vesicles, to branched woody individuals many fathoms in length. Some of them are only visible to the naked eye when they are collected in heaps; of this nature is the green and red slime that we find in damp walks, at the bottom of shaded walls, and in similar situations; others grow together in the beds of the ocean, and when they rise to the surface form floating banks of such extent as to impede the course of ships; of this kind are the Chorda filum, or *sea cat-gut*, of Orkney, meadows of which have been seen in Scalpa bay, and the *gulf-weed* of navigators, which, according to Humboldt, being carried by the Gulf stream, forms two banks in the great basin of the Northern Atlantic ocean, one of which stretches over 11° of latitude, and the other over 4°.

The genera may be conveniently divided into three sections, *jointless*, *jointed*, and *disjointed;* of each of which we shall give a few illustrations.

1. *Jointless Algæ.*—These constitute the great mass of the order; they comprehend all the broad membrane-like sea and fresh-water species, as well as the large and tough tangles and dulses so common on our coasts. Their structure is extremely simple, consisting of roundish cellules, either adhering firmly to each other, or connected by a mass of transparent gelatine. When the plants fructify, they either form little cases, in which reproductive grains are enclosed; or some part of their cells changes its appearance, acquires a deeper colour, and finally drops in pieces; or the whole mass of each individual seems, when ripe, to separate into particles capable of reproduction.

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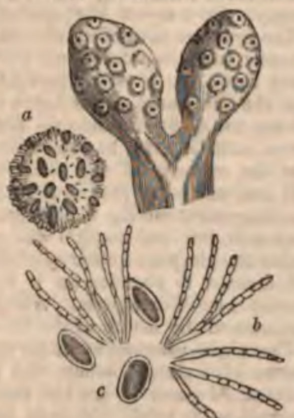
[*] This translation is, like some others of Alfred's, very free; whole chapters are omitted, but not such as contain valuable information; others are merely abridged; and in the first chapter of the first book, Alfred has inserted the Narrative of Other's and Wulfstane's Voyages. Orosius's seven books Alfred has condensed into six. Mr. Daines Barrington edited Alfred's Anglo-Saxon version of Orosius, with an English translation of Alfred's text. London, 1773. 8vo.

[†] But it is going too far to assert or insinuate, as some German authors have done after Spelman, that Alfred sent out an expedition to discover a north-east passage to India: such an opinion receives no countenance, either from Alfred's own works or from those of contemporary authors. Alfred, indeed, sent alms to India, at least, that has been asserted; but if he did so, *he sent them* as was then usual, over land.

It is in this division of the order that all the useful species, and those of large dimensions, are to be found. All the kinds that are consumed in the important manufacture of *kelp* [See KELP]; the eatable sorts, which, in the state of birds'-nests, are collected in the islands of the Indian Archipelago and sold at a high price to the Chinese; those which we consume as laver; the species that afford vegetable glue; all those from which the important medicine called *Iodine* is obtained; and finally the principal part of what our farmers use for manure, belong to the great tribe of *jointless Algæ*; of which 55 genera and about 160 species are known as natives of the coasts or ditches of Great Britain.

Of all the species, that which is the most common is the *Fucus vesiculosus*, a plant of which great quantities are cast upon our coast, and which is known by its strap-shaped, olive-green, forked divisions, having little yellowish oval uneven pods at their points, and by the crackling noise it makes when trodden upon; a circumstance which is owing to its stems having a considerable number of air bladders, by means of which it floats. The structure of the pods is highly curious. Externally they consist of a hard rind, covered with tumours, each of which has a little hole in its centre. Internally they contain a soft mucous substance, in which lie, next the rind and immediately below its tumours, a number of round balls (*a*). These little balls are composed of jointed threads (*b*), which hold together a great many little oval grains (*c*) enveloped in a sort of jelly. These grains are the means the species has of propagating itself, and when ripe they are discharged through the holes in the tumours above described.

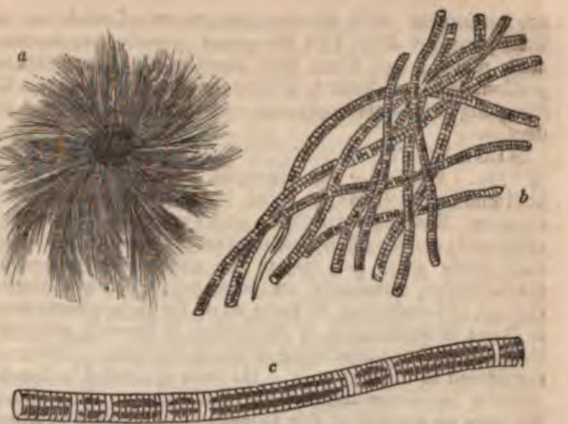


[Fucus vesiculosus.]

Another extremely common kind, *Ulva bullosa*, is found floating in ditches and in stagnant pools, where it rises to the surface in green, blistered, slimy patches, which, to the naked eye, are merely a thin membrane of the most uniform texture. But if microscopically examined, this is an object of no common beauty; it seems as if composed of little green balls (*a*), about as big as the particles in the human blood, having no sort of adhesion with each other, but holding together by a transparent thin jelly. It is by these little green balls, or by the matter they contain, that the ulva is propagated. The common *Laver* of the shops is very nearly the same thing, but is a marine species.

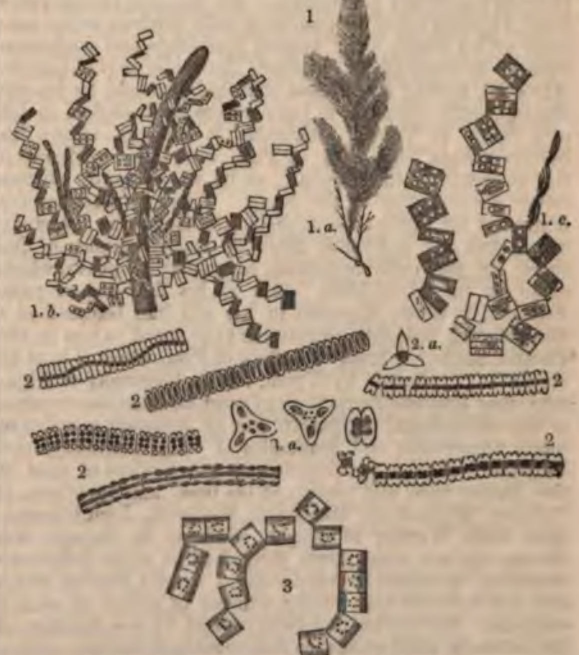
[Ulva bullosa, magnified.]

2. *Jointed Algæ.*—To this section belong the greater number of freshwater species, and many of marine station. The jointed Algæ are commonly called *Confervæ*, and are instantly recognised by their having thread-like tubes, the joints of which differ in length and in the manner in which their contents are arranged. An endless variety of these little plants may be found in ditches and running streams; and their structure is not less interesting than simple. As far as we know, they multiply by means of little granules contained in their tubes; and they grow by the addition of one tube to the end of another. They never have the tubes collected into bundles, but are always thus simply constructed. The most remarkable among them are the *Zygnema* and *Oscillatoria*, both of which approach the animal kingdom, but in unequal degrees. The species of the latter genus form dark green or purple slimy patches, in damp places, or in water, and are exceedingly remarkable for a power they possess of moving spontaneously; when in an active state their tubes are seen to unite and twist about just as if they were vegetable worms, but they grow like plants, and their manner of increase is altogether vegetable; yet they possess several of the chemical characters of animal matter, and when burnt yield a carbon of the most fetid odour, exactly resembling that of decaying animal substances.



[Oscillatoria distorta. *a*, natural size; *b*, *c*, magnified.]

3. *Disjointed Algæ.*—At this point we have reached the organic limits of the animal and vegetable kingdom. Disjointed Algæ are characterized, by their original or final spontaneous separation, into distinct fragments, which have a common origin but an individual life. They may be compared to animals living in society, and only dispersing when the necessity of multiplying their race obliges them to do so. It is upon the stems of other plants, immersed in water, or floating in pools and ditches, that these curious productions are met with; in their habits they are so paradoxical, that naturalists are far from agreed as to whether they are not really minute animals, but their mode of growth seems to compel one to answer such a question in the negative. At the same time it must be confessed that the stories which are told of them by observers deserving of credit, are such as to shake our confidence in spontaneous motion from place to place being a positive test of animal or vegetable nature.



1. Diatoma vulgaris; *a*, natural size; *b*, *c*, magnified.
2. Diatoma Swartzii, magnified; *a*, end view.
3. Fragillaria unipunctata, magnified.

Among confervæ, in ditches, are often found little microscopic fragments of organized bodies, some resembling ribands, and separating into numberless narrow transverse portions; others dividing partially at their articulations but adhering at their angles, like chains of square transparent cases. These are disjointed algæ. When combined they are motionless, with all the appearance of confervæ, and their joints are filled with the green reproductive matter of such plants; but when they disarticulate, their separate portions have a distinct sliding or starting motion. The foregoing wood-cuts represent some of these curious productions.

ALGAROTTI (FRANCESCO), was born at Venice in 1712. His father was a wealthy merchant. He studied at Rome and Bologna, in which latter place he had for instructors Eustachio Manfredi and Francesco Zanotti, who afterwards continued his friends and correspondents. Algarotti made great progress in the study of languages, the mathematics, astronomy, and anatomy. Being at Paris at the age of twenty-one, he there wrote his *Neutonianismo per le Dame*, or explanation of the system of Newton, adapted to the taste and understanding of female students. This is still considered as his best work. He next proceeded to London, whence he accompanied Lord Baltimore to Petersburgh. He gave an account of this journey in his *Letters on Russia*, a country then comparatively little known. From Russia he went to Germany, where he became acquainted with Frederic, then Crown Prince of Prussia, who was living in philosophical retirement at Rheinsberg. The prince was so much pleased with his society, that four days after his accession to the throne, he wrote to Algarotti, who was then in England, inviting him in the most pressing manner to come to Berlin. Algarotti accepted the invitation, and remained afterwards in the Prussian capital or at Potsdam the greater part of his life, not as a servile courtier, but as the friend and confidant of Frederic. The king gave him the title of count, made him his chamberlain, and employed him occasionally in diplomatic affairs. He was also commissioned by the Elector of Saxony to collect objects of art throughout Italy for the gallery of Dresden. For five and twenty years from Algarotti's first acquaintance with Frederic to the moment of his death, their mutual friendship and confidence were never interrupted. Towards the latter part of his life, Algarotti, finding the climate of Prussia too cold for his declining health, returned to Italy, where he lived first in his own house at Venice, afterwards at Bologna, among his literary friends, and lastly at Pisa, where the mildness of the air induced him to remain, as he was evidently sinking under consumption of the lungs. There he corrected the edition of his works then publishing at Leghorn; the study of the fine arts and music filled up the remainder of his time. In this calm retirement he waited for death, which came on the 3d of May, 1764, in his fifty-second year. Frederic, to whom Algarotti in his will had bequeathed a fine painting, ordered a monument to be raised to him in the Campo Santo, or great cemetery of Pisa, where it is to be seen. It is asserted by Ugoni, in his biography of Algarotti, that Frederic forgot to pay Count Bonomo the expense of this mausoleum. Algarotti was an honorary member of many universities and academies of Italy, Germany, and England. He was the friend and correspondent of most of the literary men and women of his time, among others, of Voltaire, Maupertuis, Metastasio, Bettinelli, Lord Chesterfield, Lady Wortley Montague, Madame du Bocage, &c. Besides the two works above mentioned he wrote *Letters on Painting*, in which he has described several frescoes which are now lost; he also wrote a number of essays on various subjects. His works have been swelled by the insertion of his extensive correspondence into seventeen volumes, octavo, Venice 1791. Algarotti's style seldom rises above mediocrity; his chief merit is that of having rendered science and literature fashionable among the upper classes of his time and country. He was a man of much information and considerable taste, but of a cold imagination, and not profound in any particular branch of learning.

ALGARVE, the most southern of the six provinces forming the kingdom of Portugal. The Sierra of Monchique and Caldeiraõ separate it from Alentejo on the north, and the river Guadiana from Andalusia on the east. On the other two sides it is washed by the ocean. Its extent, from the Guadiana to Cape St. Vincent on the west, is eighty-seven geographical miles in a straight line. The breadth varies from thirty to sixteen. The census of 1798 gave the number of *fuegos* or houses at 25,523, from which, if we allow, with Antillon, five persons to each *fuego*, we have for that period a population of 127,615. The surface is calculated by the same writer to be 232 square leagues. These data give a proportion of 551 persons to the square league, or ty-one to the square mile. But this population is not spread at all uniformly over the country. The mountains occupy more than two-thirds of the surface, and are but thinly inhabited, while the rich, but narrow slip along the coast, has a comparatively crowded population. Protected by its boundary of mountains from the cold winds of the north, Algarve produces the fig, almond, lemon, orange, olive, vine, and algarroba (*ceratonia edulis*), in the highest perfection; and there is little doubt that the climate would be found well suited to some of the tropical productions. On the other hand, the extent of sea coast, amounting to more than 120 miles, has given a maritime character to the inhabitants, who benefit largely by the periodical visits of the pilchard from the northern seas, and the tunny from the Mediterranean, the sea marshes near Castromarin on the Guadiana furnishing the requisite salt. These fisheries supply the navy of Portugal with her most valuable sailors. The province is divided into four *comarcas*, which take their names from the chief towns, Tavira, Faro, Lagos, and Silves, the three first of which lie upon the coast. At the mouth of the Guadiana, a little below Castromarin, there is a handsome town, St. Antonio de Arenilha, or Villa Real, which was built in 1774, by the orders of the Marquis de Pombal, at the expense of the richer inhabitants of the province. It was avowedly intended for the accommodation and encouragement of the fishermen, and a vast sum was spent upon it, but the position was so ill-suited for the purpose, that the despotic authority of the court could not induce the fishermen to abandon for it their former quarters upon the coast near Montegordo. Another object may have been to command the mouth of the Guadiana against the Spaniards. The whole province is under the ecclesiastical superintendence of a single bishop, who takes his title from it. The name Al-garve is derived from the Arabic language, and signifies *the west*. (Miñano, &c.)

ALGEBRA. This word is derived by contraction from the Arabic phrase *Al jebr e al mokābalah*, the nearest English translation of which is *restoration and reduction*. So short a definition is of course useless; we shall endeavour to give the first and most simple view of this science, our limits not permitting us to go, even in the smallest degree, into its operations.

In establishing the rules of arithmetic, it is always necessary to use general reasoning: that is, reasoning the nature of which would not be altered if other numbers had been chosen, different from those which were really employed in the question. For example: If 2 acres let for 13*l.* how much will 17 acres let for? It is shown immediately that the number of pounds required is that obtained by multiplying 13 and 17 together, and dividing the product by 2: and it appears moreover that by the same reasoning a similar rule might be established when the numbers are different from those given above, provided the form of the question remains the same. That is, if any number of acres we please to name, cost a certain number of pounds, the price of any other number of acres may be found by multiplying that other number by the number of pounds the first acres cost, and dividing by the number of the first-mentioned acres. Thus we have established a general rule, and the steps by which we translate this into an algebraical expression are as follows. We invent short signs to signify that multiplication and division are to take place: we express the former by putting × between the numbers which are to be multiplied together, the latter by writing the divisor under the dividend, and drawing a line between them. The foregoing rule then stands as follows.

$$\left.\begin{array}{l}\text{Price in pounds of}\\ \text{second No. of acres}\end{array}\right\}\text{ is }\frac{\text{Second No. of acres}\times\left\{\begin{array}{c}\text{Price in pounds of}\\ \text{first No. of acres}\end{array}\right\}}{\text{First No. of acres}}$$

So far we have abbreviated by using two *symbols of operation*; to which we may add that we write + between two numbers which are to be added together, and − between two numbers of which the second is to be taken away from the first. Now suppose that, to catch the eye, we put a letter whenever a number is named in the question, in order that by looking for that letter we may quickly find out in what part of the result the aforesaid number is used. For example: If a certain number of acres (a) cost a certain number of pounds (b), how many pounds will another number of acres cost (c)? The answer is, as above,

$$\frac{\text{Second No. of acres }(c)\times\left\{\begin{array}{c}\text{Price in pounds of}\\ \text{first No. of acres}\end{array}\right\}(b)}{\text{First No. of acres }(a)}$$

The last step is, to let the letters themselves stand for the several numbers: which will save the necessity of writing words in the result. Our final algebraical way of writing the question will then be—If a acres cost b pounds, how much will c acres cost? The answer is

$$\frac{c \times b}{a} \text{ pounds, usually written } \frac{cb}{a} \text{ pounds.}$$

To take another instance, which we first write algebraically: If a pounds of sugar, at m pence a pound, be mixed with b pounds of sugar, worth n pence a pound, the worth of a pound of the mixture is

$$\frac{ma + nb}{a + b} \text{ pence,}$$

which in the usual language cannot be stated more shortly than as follows:—To find the worth of a pound of mixed sugar, knowing how much of each sort was in the mixture, and how much each was worth per pound, multiply the number of pounds of each sort by the number of pence which a pound of it costs, add the products together, and divide by the whole number of pounds in the mixture.

This will be sufficient to give the reader an idea of the notation of algebra, and the very great abbreviation which it introduces into the details of processes. For further explanations, see ADDITION, &c., POSITIVE, NEGATIVE, EQUALITY, EXPONENT, INDEX, POWER, ROOT, and the article NOTATION.

We have said nothing of the reasoning of algebra, because it differs in no respect from that of arithmetic, or any other science, at least in the elementary part. It proceeds upon such fundamental and self-evident principles as the following:—that two equal numbers remain equal when the same number has been added to or subtracted from them, or when they have been both multiplied or both divided by the same number—that no number is altered by the addition of any number followed by the subtraction of the same, or by being multiplied by any number, if the product be afterwards divided by the same number; and so on. To take a very simple case, suppose we ask, What number is that, which multiplied by 3 and the product increased by 6, gives 30? Without knowing the number, we can see that if three times the number, together with 6, gives 30, three times the number must be 24, or the number required must be the third part of 24, or 8. The algebraical method of expressing this is as follows, where = means that the numbers between which it is placed are the same.

Let x stand for the number; then by the question

$$\begin{aligned} 3x + 6 &= 30 \\ \text{Therefore } 5x \quad &= 30 - 6 = 24 \\ \text{or} \quad x \quad &= \frac{24}{3} = 8 \end{aligned}$$

We give the preceding, not as a specimen of the advantages of algebra, but of its language only, for we have purposely chosen such a question as needs no assistance, in order to make the method of expression more evident. [See AXIOM, EQUATION, PROBLEM.]

The operations of algebra are to be considered in a very different light from those of arithmetic. In the latter science, absolute numbers are given, and an absolute number is sought: in the former, it is rather the nature of the question which is given, and it is required to find, not so much the answer to any particular case, as a general method of solving any case whatever. The symbols used are not numbers, but *general* representations of them, that is letters, each of which may stand for any number we please, provided that it keeps the same meaning throughout the question. Hence in what are called addition, multiplication, &c., of algebraical quantities, we do not ask, 'What *number* does this multiplication give,' but 'what *set of operations* are equivalent to, and, if we please, may supply the place of, this multiplication?' For example, suppose it occurs in a question that one number is to be added to, as well as subtracted from, another, and that the two results are to be multiplied together. Let a and b stand for the two numbers, of which let a be the greater. So long as we use *general* symbols, that is, so long as we do not assign some particular numbers, which a and b are to signify, we cannot perform the above operations, but can only indicate them by the marks above mentioned; for example, $a + b$ stands for the sum of a and b, $a - b$ for the difference, and

$$(a + b) \times (a - b)$$

for the product of this sum and difference. So far we need nothing more to tell us what to do, as soon as a and b shall have their values assigned to them: for instance, if a be 7, and b be 3, $a + b$ is 10, $a - b$ is 4, and the above product is 10×4, or 40. But, in the meanwhile, we see in the above a sort of double operation: there is inside each pair of brackets something to be done, while the results of the brackets themselves are connected by a further process. It is asked then, what simple processes will supply the place of the preceding, so that whatever numbers a and b may stand for, the product of this sum and difference may be obtained from them? The answer to this is obtained by the process of algebraic *multiplication*, and proves to be $aa - bb$, or b multiplied by itself, and the result subtracted from a multiplied by itself. In the preceding example, this is $7 \times 7 - 3 \times 3$, or $49 - 9$, or 40, as before. For details of various operations, see the general heads already quoted, and BINOMIAL THEOREM, DEVELOPMENT, SERIES.

The earliest treatise on algebra of which we can fix the date within two centuries is that of Diophantus, an Alexandrian Greek, who lived certainly before the middle of the fourth century after Christ, and perhaps so early as the middle of the second. It is very unlike a modern treatise on algebra, being entirely destitute of general symbols, and consisting altogether of a species of problems which have since received the name of *Diophantine*, in which it is required to solve certain questions, the answers to which shall be whole numbers only. It is so like the Hindoo algebra in its character, that it is impossible to suppose the two wholly unconnected. But as the Hindoo algebra is of a much higher cast than that of Diophantus, we are obliged to suppose, either that Diophantus obtained from the East a part of their knowledge, or that the Hindoos, setting out with the Greek algebra only, made considerable improvements after the fifth century. As the Hindoo Algebra has been very much extolled by some, and more than proportionally cried down by others, we quote from Delambre, who is distinguished among the latter. 'The Hindoos had algebra of the first and second degrees; they knew how to solve indeterminate problems; and they made these acquisitions themselves; they are also the authors of the system of arithmetic now universally received by us.'—*Histoire de L'Astronomie Ancienne*, vol. i., p. 556. To these we might add many minor points, and also that, in the solution of indeterminate equations of the second degree, they had made as much progress as ever was made in Europe before the middle of the eighteenth century. We must refer those readers who are curious upon this subject to the preface of Mr. Colebrook's translation of the *Bija Ganita*, and to the history of algebra in the second volume of Dr. Hutton's *Mathematical Tracts*.

The Persians and Arabs confessedly derived their knowledge of the subject from the Hindoos. We do not, however, find that they proceeded as far as their masters: for the Arabic treatises, so far as we know, contain only the solution of equations of the first and second degree, and their application to various arithmetical questions, excluding all mention of indeterminate equations.

It was by means of the treatise of Mohammed Ben Musa, who lived in the time of the Caliph Al Mamun, that the science was introduced into Europe. A complete and able translation of this work, by Dr. Rosen, with the original Arabic, was published in 1831, by the Oriental Translation Fund.

Thus much of the science was introduced into Europe, or rather into Italy only, at the beginning of the thirteenth century, by Leonardo Bonacci of Pisa. Algebra lay dormant in Italy, without receiving any material improvement, till the middle of the sixteenth century, when it was introduced into Germany, France, and England, nearly about the same time by Stifelius, Peletarius, and Robert Recorde, respectively. The Hindoos, instead of using the letters of the alphabet, designated various unknown quantities by the names of different colours; the Persians and Arabs employed the word answering to 'thing' in their language for the unknown quantity, and the Italians adopted the word 'cosa' for the same purpose: hence algebra came to be called the *Regola de la Cosa* in Italy, and the *Cossike Art* in England. It is to be observed, however, that in no country, up to the time of Vieta, were letters used to signify anything but quantities sought; those *given* being always certain numbers, and never arbitrary representations of numbers in general. Hence the simple word '*thing*,' or any abbreviation of it, was sufficient for their purpose.

While algebra was being introduced into the various countries of Europe, the Italians began to make the first steps towards its improvement. The solution of an equation of the third degree was discovered by Cardan and Tartaglia; that of the fourth by Ferrari; while various other discoveries were made by Bombelli and Maurolico. We must refer the reader to the several lives of these mathematicians. Vieta, a Frenchman, who died in 1603, made the grand improvement of using letters to stand for known as well as unknown quantities, and with the additional power derived from this improvement, laid the first steps of the general theory of equations. In England, Harriot, who died in 1621, carried on and extended the discoveries of Vieta; and from the time of the two latter we must date the modern form of the science.

Our limits will not allow us even to name the crowd of discoverers who have extended this branch of pure mathematics since the time of Vieta. We must refer to the work of Hutton already cited, to Bonnycastle's translation of Bossut's *Histoire des Mathématiques*, or to the original work itself: to the preface of the mathematical part of the French Encyclopædia; or to the histories of Montucla and Cossali. The first and second are the most likely to fall in the way of the English reader.

The only necessary preliminary to the study of algebra is a good knowledge of the four rules of arithmetic, and of common and decimal fractions. Without so much it is impossible to read any work with profit; and in the want of it we must look for the reason why the science appears repulsively dry to most persons. On this subject, we refer the student to some remarks in page 59 of the treatise on the *Study of Mathematics* published by the Society.

ALGEBRAIC. An expression is said to be *algebraic*, as distinguished from *transcendental*, when its number of terms is finite, and when each term contains only addition, subtraction, multiplication, division, and extraction of roots, the exponents of which are given. Thus all infinite series, as well as expressions containing

$$\log x,\ a^x,\ \sin x,\ \cos x,\ \text{\&c.},$$

though used in algebra, in the widest sense of the word, are improperly said to be not *algebraic*, but *transcendental*. Similarly, a curve is said to be *algebraic* when its equation (see Curve) contains no transcendental quantities.

ALGEBRAIC GEOMETRY. A name given to the application of algebra to the solution of geometrical problems. For the principal points of interest connected with it, see Abscissa, Ordinate, Co-ordinates, Curve, Curvature, Equation, Tangent.

ALGECIRAS, a maritime city of Spain, on the western side of the bay of Gibraltar, which is about seven miles across, but the distance by land from the fortress is seventeen miles. It contains an aqueduct, a dock-yard, and a citadel nearly in ruins. One of the most important articles of commerce is the coal found in the neighbouring mountains. There have been found here several Roman inscriptions and other antiquities. Population 9900. 36° 8′ N. lat., 5° 26′ W. long. Al-Geciras is an Arabic name, and signifies 'the Island.'

ALGECIRAS, or **ALJEZIREH**, 'the Island,' is the Arabic name of the ancient Mesopotamia.

ALGHERO or **ALGERI**, a town on the west coast of the island of Sardinia, in 40° 28′ north lat., and 8° 21′ east long., about fifteen miles south of Sassari.

The town was founded about the beginning of the twelfth century, and, in 1353, surrendered to the Aragonese. The citizens very soon revolted and overcame their conquerors, but were reduced to obedience in 1355, when the Sardinian and Genoese inhabitants were expelled by the Spaniards, and their places supplied with Catalans. Alghero was made a bishop's see in 1503, and five years after was fortified. It became a very favourite residence of Charles V. of Spain, who, following a custom then prevalent, gave to it the title of 'most faithful.'

The town stands on the shore, and is built in the form of a parallelogram, on a low rocky point, jutting out from a sandy beach. It is surrounded by stout walls, flanked with bastions and towers. The streets are narrow, but well paved and cleanly. There are two entrances through gates, one at the mole or landing place on the north, and the other at the ravelin in the land front.

Alghero contains twelve churches and convents, besides a spacious cathedral. The bishop is suffragan to the bishop of Sassari. The town also contains several public schools, the students in which are carried through a course of philosophical instruction. There are some fountains of pure water outside the town, but within, the inhabitants obtain their supply of this most necessary article by means of cisterns.

The country round is well cultivated and has a pleasing appearance. It produces abundance of wine of good quality, as well as butter, cheese, vegetables, and fruits. Tobacco has of late years become a profitable object of cultivation. The exports from the town consist of wine, tobacco, wool, skins, rags, anchovies, coral, and bones, which latter article is much in demand by the sugar refiners of Marseilles, who use animal charcoal in large quantities. The coral obtained at this part of the coast is the most highly esteemed of any in the Mediterranean sea for its quality.

The town stands in a spacious bay, formed on the north by the south point of Cape Caccia, and on the south by Cape Marargin. The anchorage within is good. The town contains 6700 inhabitants. [Smyth's *Sketch of the present State of Sardinia*; Malham's *Naval Gazetteer*.]

ALGIERS, the Regency of, one of the Barbary States, is bounded on the east by the Regency of Tunis, by the Empire of Morocco on the west, the great desert of Sahara on the south, and by the Mediterranean sea on the north. Its greatest length from the river Zayne on the Tunis frontier to Twunt on the western frontier, at the foot of the mountains of Trara, 40 miles east of the Mulloiah River, is about 500 miles; its breadth cannot be stated with precision, as the confines between its dependencies south of the great Atlas chain, and the roving inhabitants of the Sahara, are not determinate. We know, however, that the sway of Algiers extends at least as far south as the Wadadjedee River, about 200 miles' distance in a direct line from the capital. Reckoned from other points the breadth is much less. The territories of the regency are divided into four governments, namely, 1. Al Jezira, or Algiers properly so called; 2. Titteri, to the south of it; 3. Constantina, or Costantina, to the east; 4. Mascara or Tlemsen, to the west. The three last provinces are each ruled by a Bey, who was appointed by and dependent upon the Dey or Pacha of Algiers, till the late French occupation of the capital. Many tribes, however, live scattered about the country, who either have always refused to acknowledge the successive rulers of the coast and capital, or whose subjection is merely nominal, and confined to the payment of an annual tribute. It is impossible to ascertain with accuracy the population of the whole country, but, judging by approximation, it cannot be less than 2,000,000.

The chain of the Atlas runs through the whole length of the Regency, and its various ridges, with the intervening valleys, occupy the greater part of its surface. A central ridge, or succession of ridges, marks the boundary between the Tel or country fit for tillage, and the Sahara, and divides the waters that run into the Mediterranean from those that flow southward, and lose themselves in the marshy lakes of the interior, the Shott and the Melgigg. This ridge begins with the mountains south of the town of Tlemsen on the borders of Marocco, then runs in a north-east direction to Mount Wannashrees, the Mons Zalacus of Ptolemy, a huge rugged mountain generally covered with snow, and one of the most noted landmarks of the country south-west of Algiers. It is situated in the eastern part of the province of Mascara, about sixty miles south from Cape Tennes. To the eastward of the Wannashrees, in the province of Titteri, are other high summits called Titteri-Dosh and Jebel Deera; and farther to the N.E., on the borders of Costantina, is Mount Jurjura, perhaps the Mons Ferratus of the ancients, which is as conspicuous in the eastern province as Wannashrees is in the western. The Jurjura is seen from the coast about Bujeiah, and is always covered with snow in winter. The Jurjura seems to belong more properly to the little Atlas chain. From this point the central group of the Atlas, which from the borders of Morocco runs so far nearly parallel to the sea-coast, assumes a south-eastern or inland direction, forming the high ridges called Wanougah and I-aite, which are succeeded farther to the east, but more in a parallel line with the sea-coast, by those of the Welled Selim, Mustewah, Auress, and Tipasa, the last continuing the chain into the territory of Tunis east of the Mejerdah River, between 35° and 36° latitude. Another and a lower ridge, or continuation of ridges, known to geographers by the name of Little or Maritime Atlas, rises nearer the coast from the mouth of the river Shelliff, whose bed divides it from the central chain, and running between its northern bank and the sea, forms the heights called Summata, Teneah, and Magrouah, which divide the plain of Metidja, in the immediate district of Algiers, from the province of Titteri, and thence, after connecting itself with the higher chain of the Jurjura, detaches itself again, continuing direct east through the northern part of the province of Costantina, forming the summits called Sgawe and Artyah, and thence runs into Tunis towards Bizerta. Numerous projections from this chain run into the sea, and form the abrupt promontories called by the Mediterranean sailors Cape Carbone, Cape Jiljili, Cape Bougaron, Cape Iron or Ras Hadeed, Cape Rosso, &c. The height of the little Atlas to the south of the city of Algiers, near the town of Medeyah, is from 1000 to 1500 feet. Besides these two divisions of the chain Atlas, we know that there are other, and some very high, summits a long way south in the Sahara; but whether they form a continuous ridge, or are merely detached groups, branching from the central chain, is not well ascertained, any more than their height or position. The Mounts Zaggos, Sahari, and Zekkar, south of the province of Titteri, and between the parallels of 34° and 35°, and the Mounts of the Lowaate farther to the south-west, in which the Wad-ad-jedee has its source, are in the country called by the Moors Beled-el-jerrid, or Land of the Palm-tree, but which the Arabs know only by the general name of Sahara, and which can hardly be said to be subject to Algiers. This was the country of the Gætuli, which Strabo calls 'a Mountainous Land.'

The principal river of Algiers is the Shelliff, which has its sources within the borders of the Sahara, south of the Wannashrees Mountains; flows N.E. into Titteri, and after receiving the Midroe, which comes from the southernmost Atlas, forms the Titteri Gawle or Lake, and then runs north until it meets the little Atlas ridge not far from Medeyah; its current then turns abruptly westward through the province of Mascara, and after a course of nearly 300 miles enters the sea below Cape Ivy, or Jebel Dis. During the rainy season it overflows a great tract of country, so as to interrupt the communication by land between Algiers and Oran. The other rivers are the Yisser, to the east of Algiers; the Zowah, or river of Bujeiah; the Wad-el-Kebeer, Ampsaga of the ancients, which flows into the sea north of Costantina; and the Seiboos, or river of Bona. South of the Atlas is the Wad-ad-jedee, or 'river of the Kid,' a considerable stream which runs from west to east for nearly 200 miles, and after watering and fertilizing the country called Zaab, and receiving a number of minor streams from the central Atlas, loses itself in the Melgigg, a marsh on the borders of the desert. There is another marsh of great extent on the south-western borders of Costantina called the Shott. 'It is a large plain or valley between two chains of mountains, which, according to the seasons of the year, is either covered with salt or overflowed with water. Several parts of the Shott consist of a light oozy soil, which, after sudden rains, or the overflowing of the adjacent rivers, forms quicksands, to the great danger of the unwary traveller.' (Shaw's *Travels in Barbary*.) Several small streams from the north, and a considerable one from the south, called Mailah or Shayer, which has its source in the Mount Zekkar, and is said to be salt, lose themselves in the Shott.

The climate of the country north of the Atlas is generally healthy and temperate, but when the khamsin or south-wind blows, the thermometer rises sometimes to 100° of Fahrenheit, and even more; this, however, lasts only from two to five days. This wind is dry, and although depressing, is not otherwise unhealthy. It carries along with it a quantity of extremely fine sand, which penetrates into the houses and through every crevice. From April to September the prevailing winds are from the east, and the rest of the year they are mostly from the west. The heavy rains are in November and December, the months of January and February are generally very fine. In April the fields are clothed in their brightest verdure. From July to October the surface of the country is burnt by the rays of the sun; the oleander alone remains green. Near the coast, however, the sea-breeze cools the air during the day, and heavy dews fall at night. The atmosphere is very pure and bright, but is considered unfavourable to persons of weak sight. Ophthalmia is a common disease, as well as cutaneous disorders, and even elephantiasis, owing principally to the want of cleanliness in the country people. No bad fevers or other endemic diseases are prevalent.

The fertility for which this country was renowned in ancient times still continues; in the valleys that are watered by streams, vegetation is extremely luxuriant. The mould is of a very dark colour; in some places it is reddish, and impregnated with nitre or salt, but generally the soil is much less sandy than in Tunis or Morocco. The country is also more hilly, the springs are more frequent, and the dews more abundant, than in the adjoining states. The hills are covered with fruit trees of every kind, and the fruit is generally exquisite. A species of the lotus is found here, the fruit of which is eaten. The palm is indigenous, but the best dates come from the other side of the Atlas. Few timber trees are to be seen except a species of oak, the *quercus ballota*, which bears a very nutritive kind of acorn. The mountains near Bujeiah used to supply the dock of Algiers with timber. There are many species of the cypress and chestnut trees. There are also very extensive plantations of *nessri* or white roses; these flowers are much larger than those of Europe, and yield the essence known by the name of attar of roses. The sugar-cane grows in this country; a species of it called Soleyman rises to a great height, and gives more sugar than any other species known. The *indigofera glauca* thrives also. The grain sown is wheat, barley, Indian corn, millet, doura, and also rice.

The cows of Barbary are small, give but little milk, and generally lose it altogether with the loss of the calf. Algiers and Morocco are the original countries of the Merino sheep. Goats are very numerous, and supply the people with milk. Horses are proverbially excellent; the asses are uncommonly fine and much used for riding; the country people eat the flesh of the young ones. Their mules are excellent. The camel is considered superior to that of Asia, and good cheese is made of its milk. The interior of the country abounds with wild boars, porcupines, antelopes, and all sorts of game. In the fastnesses of the Atlas are panthers and leopards, but no tigers; the lion still maintains the character of its Numidian progenitor for superior strength, fierceness, and also, at least according to Arab report, for its occasional forbearance and generosity. In the desert of Angad on the borders of Morocco are large flocks of ostriches. The country is infested by various venomous reptiles and insects, especially scorpions of large size, whose bite is dangerous. There are also serpents of the boa kind. The locusts pay occasional visits, when they destroy the harvest of whole districts in a few days; the tribes south of the Atlas eat them.

The races that inhabit the territory of Algiers may be reckoned seven in number: Berbers or Kabyles, Arabs, Moors, Turks, Cooloolis, Jews, and negroes from Soudan. One half of the whole population consists of Kabyles, the aborigines of the land: although somewhat mixed with the various nations that have successively conquered the country, they still retain much of their Numidian character and habits. The name of *Berbers* is of uncertain origin, and they themselves are unacquainted with it; they call themselves Mazigh or Amazirgh, which name was known to the old geographers and historians. Ammianus Marcellinus calls the island on which the light-house of Algiers is built, *insula Mazucana*. The oldest Arabian writers call the town of Algiers *Jezira Beni Mazighanan*, the island of the Sons of Mazigh. The Mazigh race is believed to have extended at one time all over North Africa, from the borders of Egypt to the Canary Islands: they spoke one common language, of which the Showiah and the Shillah of the Berbers are dialects, as well as the language of the Guanchos of the Canary Islands, and probably also the language spoken by the Tuaricks of the Great Desert. The Moors call the Berbers 'Kabyles,' from Kabileah, *i. e.*, clan, but they often give this appellation indifferently to the tribes of the interior, whether Berbers or Arabs, although two very distinct people, because both are living in clans. The Kabyles inhabit the whole of the mountainous country, both along the great and the little Atlas chains, while the Arabs occupy the intermediate plains. The clans of the former assume before their names the Arabic prefix *Beni*, as Beni-Mozab, whilst many of the Arab tribes scattered about the country of Algiers use that of Welled, which means the same, such as Welled-Helfa, the children of Helfa. The Kabyles live in villages called *dashkrahs*, consisting chiefly of huts which they call *gurbie*, made of mud and loose stones, covered with branches of the palm-tree, and thatched with turf or straw. The Arabs generally live under tents, in camps, which are called *dowar*. The Kabyles who live on the little Atlas and near the coast understand Arabic, but the tribes farther removed in the interior know no language but their own. More advanced in agriculture than the Arabs or Moors, they understand the method of irrigation; 'we have seen,' says Captain Rozet, 'in the neighbourhood of Belida, orchards and fields as neatly arranged and as carefully cultivated as those of France. The Kabyles work the mines of their mountains, and extract iron, copper, and lead; it is said, even gold and silver: their arms are frequently decorated with silver plates very well wrought, and they make a spurious coin of silvered copper. They make guns, ploughs, and many coarse utensils, which they sell to the Arabs and Moors, know how to temper steel, and make also sabres and knives of a tolerable quality. They manufacture gunpowder for their own use, and much better than that which is made at Algiers, but they never sell any of it. The Kabyles are very eager after European guns; they offered me as much as the value of two hundred francs for mine. Their women weave common woollen and linen stuffs for the use of the family. They do not bake bread, but they crush the grain between two stones, make a paste of the flour with water, and bake it under the ashes, or fry it with oil. The olive is their chief produce, but the oil they make is very sour, probably because they allow the fruit to ferment before they press it. They carry great quantities of it in skins to the Algiers market. They make a kind of soap with oil and soda. The Kabyles grow pears, apples, apricots, peaches, and grapes, in all the chain of the little Atlas. They gather a great quantity of honey and wax, which they bring to Algiers; with poultry, dates from the other side of the Atlas, lion and panther skins, and monkeys. The tribes who live on the borders of the plain, or in the great valleys, have cattle, and flocks of sheep and goats. They have no camels, this animal not being suited to mountainous regions, but they have excellent asses and mules which they never sell. The Kabyles are a middle-sized race, of spare habit of body, but robust and well made, and even elegant in their forms. Their complexion is generally dark, but seldom swarthy. Their heads are more round, and their features shorter, than those of the Arabs; they have not the fine aquiline noses so common among the latter; the expression of their countenance is intelligent, but somewhat sinister and ferocious. The furniture of their huts is very simple; a few sheep-skins or mats spread on the ground or on a wooden platform in a corner, serve them as beds; their *hykes*, which resemble in shape the plaid of the highlanders, and their *boornooses* or cloaks with hoods, which constitute their dress by day, serve them as blankets at night; a few baskets, earthen dishes, pots, and jars, for their milk and honey; they keep their grain and fruit in large vats made of clay baked in the sun, or bury them in holes under ground. In almost every hut of the Beni-Sala we found a Koran, which the inhabitants had left on running away. The women wear the hyke like the men, with a close short-sleeved tunic underneath; they do not veil their faces like those of the Arabs and Moors; they let their hair fall on their shoulders; they wear large earrings, paint their arms and legs in various devices, and their nails and the palms of their hands with henné or vegetable red.' The short account of the Berbers of Morocco, and their appearance and language, given by Lieutenant Washington in his 'Geographical Notice' of that empire, inserted in the first volume of the *Journal of the Royal Geographical Society of London*, agrees with most of the above particulars of the Kabyles of Algiers, and serves to strengthen the supposition that they are all of a kindred race. Each tribe of the Kabyles has a sheik or chief, like those of the Arabs; there are also families of rank among them. Each tribe has its Marabut, who is a sort of oracle: these men are considered holy, and are allowed every liberty. They accompany the tribes to war, and exercise great influence over them. The Kabyles, especially those remote from Algiers, have never submitted to either Arabs or Turks; they pay no regular tribute, but the Dey used to send parties of janizaries to seize their cattle, or kidnap several heads of families, for whom he made them pay a heavy ransom. The Kabyles in their mountains are inhospitable, and different in this respect from the Arabs: they are capricious and faithless, like their Numidian ancestors, very cruel to their enemies, and seem to delight in tormenting their unfortunate prisoners, whom even the women have been known to join in torturing. They are Mohammedans, and practise circumcision, but never frequent the mosques of the Moors. Those who live at or come to Algiers have a separate place of meeting for themselves. Their religion seems, however, very superficial, and mixed with superstitious practices.

The Arabs who encamp in the plains are known also by the name of Bedoweens, and indeed the latter appellation is often given indiscriminately to the Kabyles also by the people of the towns on the coast. These Arab tribes are the remains of the various great immigrations of their countrymen from the east, and have kept themselves distinct from the other races around them. They resemble in their appearance and habit their Asiatic ancestors, of whom they boast. They often move their camps in quest of water, or fresh pasture for their flocks. They speak the Koreish or eastern Arabic with more or less purity; are strictly observant of the Koran, are governed by their elders or sheiks, and are all tributary to the bey of their respective province. When dissatisfied with the Turks, they often move their camp in the night, and withdraw with their cattle into another state, or plunge into the Desert. Not many years since, the wide plains of Bona and Costantina were all on a sudden left solitary, the Arabs having withdrawn across the frontier into the state of Tunis. Some of the Arabs are cultivators of the soil, and have villages in the neighbourhood of the towns, but they are very careless in their agriculture, and will, when dissatisfied, abandon their huts and remove to another district. The Arabs are strict in their conjugal duties, and differ in this from the Kabyles, among whom the marriage bond is held very loose. In their predatory habits, their frugal diet, their fondness for music, and story-tellers, the Arabs resemble the rest of their brethren scattered over Asia and Africa. The women are generally spare, swarthy, and ill-favoured.

The name of Moors has been used in Europe in a general sense, meaning the African Arabs; but the present Moors of Barbary are become a people distinct from the original Arabian conquerors, as well as from the actual nomade Arabs, who live in the interior of the country. The Moors constitute the bulk of the population of the towns and the districts immediately around: they are a very mixed race, sprung from the various nations who have successively occupied the country; the Arabian stock, however, which was engrafted on the population existing at the time of the Mussulman conquest, may be supposed to predominate. Their number was much swelled by the Moors who were driven away from Spain. They are not so swarthy as the Bedoweens; the men who are much exposed to the rays of the sun acquire a very dark complexion, but their women and children are as clear as those of Europe, and often very handsome. Fatness is an indispensable condition of female beauty among the Moors, and great pains are taken by mothers and nurses in order that their girls may attain this desideratum. The Moors are further advanced in civilization than the Arabs or the Kabyles; they are used to the comforts of towns, many of them are wealthy, and fond of luxury and pleasure. But their moral character stands very low. They have all the vices of the Arabs without their virtues, and the fierce, brutal passions of the Turks without their bravery. They are lazy, sullen, vindictive, and cruel. Lasciviousness and unnatural lust are common vices among them as among the Turks. Having been for ages accustomed to tremble before the military despotism of the Ottomans, the Moors are pusillanimous, servile, and treacherous. They are not deficient in intelligence; all the boys frequent the schools, where they learn reading, writing, and arithmetic at a trifling cost; elementary instruction having been established at Algiers for ages past on a method somewhat resembling the Lancasterian. The Moors speak the Moghrebin or western dialect of the Arabian language.

The Turks, who for more than three centuries have been the rulers of Algiers, formed a militia which seldom amounted to ten thousand; and though it was at last reduced to five thousand, even this small body kept the whole population in perfect submission. They were nominally, at least, under the orders of the Sultan, as lord high sovereign of the country. The Dey was selected from among their own body. Every other year fresh recruits from the Levant, lawless characters from Constantinople, Salonichi, and Smyrna, with fierce Arnauts from Albania, came to fill up the vacancies. Christian renegades were occasionally admitted among them, but Moors or Arabs never. The main body of the Turks was stationed at Algiers, but detachments were sent as garrisons to the various towns of the provinces. In case of attack from other powers, the Moors, Arabs, and Kabyles served as auxiliaries under the orders of the Turks. The janissaries, as the Turkish militia were called, were well paid, and their pay continued for life, even after they retired from the service. They enjoyed great privileges, and any insult offered to them by the natives was punished with death; indeed they generally took the law into their own hands and inflicted summary punishment. They were not subject to the common tribunals for any offence, but were tried before their own court, and punished privately by their Aga. As the Turks had no women of their nation, they married either Moorish women or Christian slaves; the offspring of these marriages, called Kooloolis, constitute a considerable proportion of the population of Algiers and the other towns. Their number is reckoned by Mr. Gräberg, the Swedish consul, at 17,000 in the city of Algiers alone. Some of the Kooloolis entered the militia, others were employed in various offices under government; many are possessed of property, which their fathers or themselves have acquired, especially by holding shares in the privateers, for this was a profitable speculation of the Turks. They are generally good-looking, and have clear complexions like their Turkish parents. All the above races, being Mohammedans, are polygamists.

The Jews came in great numbers to Algiers on being driven away out of Spain and Portugal, at the same time as the Moors. They are reckoned to be between 40,000 and 50,000, living in the principal towns, chiefly on the coast. They are, as every where else, brokers, agents, jobbers, retailers, hawkers, and some of them are merchants and bankers. Despised and ill-used by the Turks, they were still necessary to them in all money transactions, in all maritime speculations, and in their financial operations. They exercised by this means considerable influence on the members of the government. Many of them grew rich, though in continual dread of losing both their property and their lives.

The negroes are slaves brought from Soudan by the caravans or kidnapped by the Bedoweens of the Desert. Between 4000 and 5000 were brought every year into the territories of Algiers, one half of whom were taken to the capital, where they were exposed in the bazaar, and sold partly to wealthy Moors or Turks, and partly to speculators who exported them by sea to the Levant. The blacks in the service of private individuals at Algiers are generally treated with considerable mildness; they are, in fact, household servants.

The territory of Algiers includes the several divisions of ancient Numidia, both of the Massyli and of the Massæsyli, the kingdoms of Massinissa and his rival Syphax, and afterwards of Jugurtha. It also includes part of the Mauritanian kingdoms of Bocchus and of Juba. It was conquered successively by the Romans, the Vandals, the Byzantine Greeks, and lastly by the Arabs, who invaded North Africa at the beginning of the eighth century, and established Islamism. Ferdinand the Catholic, after driving the Moors from Spain, sent an expedition to Africa under Cardinal Ximenes and Don Pedro Navarro, which took possession, in 1509, of Oran and Marsa el Kebir, and of Bujeiah in the following year. They also took possession of the island before Algiers, and built a fort there. The Moors of Algiers, who were under a chief called Selim Eutemi, called to their assistance the Turkish corsair, Horush, who had made himself famous by his exploits in the Levant seas. Horush landed at Jiljili in 1516, and soon after attacked the Spaniards in concert with the Moors, and re-conquered part of the country. Having rid himself of Selim Eutemi by violence, he remained master of Algiers, where he ruled tyrannically. He afterwards marched westward and took Tlemsan, but being attacked both by the Spaniards from Oran, and by the Moors who revolted against him on account of his cruelties and extortions, he put himself in march with his Turks to regain Algiers, but being overtaken and surrounded near the river Mailah, not far from Oran, he died fighting, in 1518. Horush, when cruizing in the Levant, was called familiarly by his crews, Baba Horush, or 'Father Horush,' which the European sailors corrupted into Barbarossa. His brother, Khair-ed-din, to whom he had left his ships, succeeded him in the dominion of Algiers, and to secure his authority, put himself, in 1519, under the allegiance of the Sultan of the Ottomans, Selim I., who appointed him Pacha and Regent of Algiers, and sent him a body of janissaries. Khair-ed-din took from the Spaniards the island before Algiers, which he joined by a pier to the main land in 1530, thus forming a safe harbour. He manned a large fleet with which he swept the Mediterranean, striking terror among the Christian sailors. Solyman I. called him to Constantinople, and raised him to the rank of Capudan Pacha or Great Admiral. Hassan, a Sardinian renegade, who succeeded him in the regency of Algiers, continued to scour the sea and make incursions on the coast of Spain. Charles V., in the plenitude of his power, was baffled in his attack upon Algiers in 1541. A terrible storm dispersed his fleet, and the army was obliged to re-embark in the greatest confusion. From that epoch the Algerines thought themselves invincible, and extended their piracies not only all over the Mediterranean, but also into the Atlantic. They seized the vessels of all nations who did not agree to pay them a tribute. Admiral Blake first taught the Algerines to respect the flag of England. Louis XIV. caused Algiers to be bombarded in 1683 by Admiral Duquesne, which led to a peace in the following year between France and Algiers. The Spaniards, under General O'Reilly, landed near Algiers in 1775, but were obliged to re-embark in haste and with loss. The Dutch, after several combats with the Algerines, by paying a sum of money, obtained respect for their flag. So did likewise the Danes and Swedes. The Austrian and Russian flags were protected by the special interference of the Porte, in consequence of treaties with the latter. But the Italian states were the greatest sufferers from the piracies of the Algerines and the other Barbary powers, who not only seized their vessels and cargoes, but made slaves of all on board, who were either sold in the market, or sent, chained, to the public works. The precise epoch of the beginning of this organized, and we may almost call it legalized, system of piracy, for it was recognized by the various treaties which the Christian powers condescended to sign, appears to date from the end of the fifteenth century, when the Spanish Moors, driven out of Granada and Andalusia, settled on different points of the opposite coast of Barbary, and thence retaliated upon their Christian enemies by seizing their vessels. The establishment of the Knights of St. John in the Island of Malta, whose profession was one of constant warfare against Mussulmans, tended to keep alive and to justify the system of indiscriminate reprisal on the part of the latter. But cupidity was the great incentive, as the produce of the prizes and of the slaves was an essential source of revenue to the Algerine government, and of profit to private speculators. It was a common saying, that Algiers without privateers must starve. In 1815 the Algerine power was checked in its lawless exactions by the ships of the United States, which took an Algerine frigate and brig: the dey was also compelled to conclude a treaty with the Americans, renounce all tribute, and pay them 60,000 dollars as compensation for the ships that had been plundered. Lord Exmouth, in execution of the determination taken by the congress of Vienna, put an end to Christian slavery in 1816; but the Algerines still claimed the right, as an independent power, of declaring war against any state they chose, and of seizing its merchant vessels, and releasing the crews or keeping them in prison till peace was agreed on. At last an insult offered by Hussein Pacha, the last dey, to the French consul in April, 1827, induced the French government to send an expedition on a very large scale to take possession of Algiers. This was effected in June, 1830. Algiers capitulated to General Bourmont, the dey abdicated and retired to Europe, while the French took possession of the town, of the fleet, and of the treasury, where they found above two millions sterling in precious metals and stores. They garrisoned Algiers, and established a sort of military government under the general in chief. They have also garrisons at Oran and Bona, but do not possess any ground beyond the walls of those towns. Their dominion south of Algiers does not extend beyond the first ridge of the little Atlas. They have appointed a new bey of Titteri, but the Kabyles and the Arabs are at war with them both in Titteri and Mascara, and the bey of the great province of Costantina has refused to submit. The latter has assumed the title of pacha, and seems to consider himself independent. One great advantage, however, has resulted from this expedition; the Mediterranean sea has become free from Algerine privateers which have been its scourge for more than three centuries.

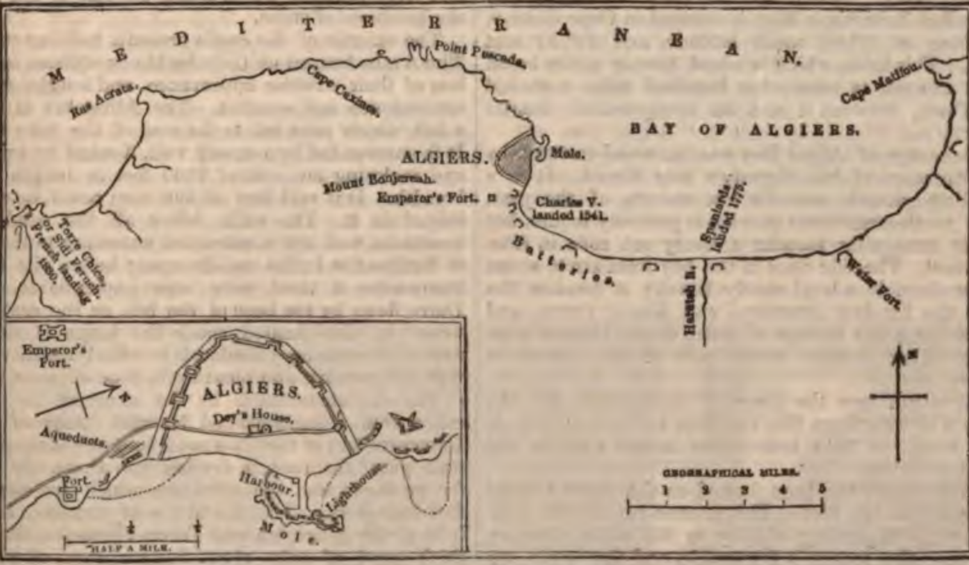
The title of dey, which in Turkish means 'Uncle,' was not lately used at Algiers: the sovereign was styled pacha and effendi; the Moors called him Baba, 'Father.' He was elected by the bashis or officers of the militia, assembled in dewaun, or rather by a faction of them, which also frequently shortened his reign by a violent death. Few sovereigns of Algiers for the last two centuries have died of natural death. Any common janissary might aspire to the supreme rank. The sultan formerly used to appoint the pacha of Algiers, who was at the same time commander of the forces, and to send men and money for the service of the garrison, but the Turkish militia obtained in the seventeenth century the right of choosing their own commander, and paying themselves out of the revenue of the regency: still the sultan continued to send a pacha as civil governor until the beginning of the last century, when Baba Ali Dey or chief of the militia seized the then pacha, put him on board a ship, and sent him back to Constantinople. He sent by the same vessel envoys with rich presents to the vizier and other officers of the Porte, representing to them that the expelled pacha had treacherous views, and that in future the chief of the militia might as well fulfil the duties of pacha also, of course with the approbation of his highness. The affair was winked at by the Porte, and from that time the janissaries and the dey of their choice were absolute masters at Algiers.

The principal towns of the regency of Algiers are, next to the capital, Costantina, the ancient Cirta, with a population of about 30,000 inhabitants, [see COSTANTINA,] Bona, near the site of Hippona, the see of St. Augustine, with a population of 4000 inhabitants, and a capacious harbour nearly choked with mud. To the eastward of Bona were La Calle and Bastion de France, two old French settlements which were destroyed in 1827. This coast is frequented by the coral-fishing boats from France and Italy. Westward of Bona is Jijel or Jiljili, a harbour and a fort. The Kabyles of this mountainous coast are the most ferocious of the whole country, and merciless plunderers of wrecks. Bujeiah, on the gulf of the same name, once a place of considerable importance, now reduced to 5000 inhabitants, with a good harbour, carried on some trade in oil and wax, the produce of its territory. In the interior of the vast province of Costantina are many remains of cities once famous, such as Seteef, once the capital of the Mauritania Sitifensis; Tiffesh once Thebestis, in a very fertile plain, which extends towards the Mejerdah or Bagradas river; Tipsa, the ancient Tipasa, a frontier town towards Tunis, with an Algerine garrison. In the same neighbourhood is Gellah, also a frontier town, built on a mountain almost inaccessible, a place of asylum for the outlaws of the two states, who countenance one another, and live in a sort of wild freedom. Zainah, in the southern part of the province, Dr. Shaw supposes to be the ancient Zama, he having found no other vestiges answering to this place. The most remarkable antiquities next to those of Cirta are found at Tezzoute, in a valley of the Jibbel Auress, about fifty miles south of Costantina, and which appear to belong to the ancient Lambæsa: the ruins are nearly three leagues in circumference; among the rest are magnificent remains of the city gates, several Roman inscriptions, parts of an amphitheatre and of a triumphal arch, the frontispiece of a beautiful Ionic temple, and an elegant little mausoleum built in the shape of a dome supported by Corinthian pillars, which the Arabs call 'the Cupola of the Bride.' The Jibbel Auress, Mons Aurasius, is an extensive group of mountains with fertile valleys intervening, embracing an area of nearly 100 miles in circumference, and inhabited by a number of clans of Kabyles, whom neither Arabs nor Turks have ever subjugated. Some of these tribes are much fairer than the generality of the Kabyles, and have hair of a yellowish colour, which has led Dr. Shaw and others to suppose them to be a remnant of the Vandals. The whole province of Costantina is highly interesting, and full of ancient remains, but little explored by travellers: it is decidedly the finest, as it is the largest and most important division of the regency. In the province of Titteri is the town of Medeyah, the residence of the bey, in a fertile district in the midst of the little Atlas; it reckoned above 10,000 inhabitants, but suffered severely in the several conflicts in 1830-31 between the French and the Arabs and Kabyles. Belida, situated between Medeyah and Algiers, on the borders of the fine plain called Metidja, with a population of 9000 inhabitants, has been equally unfortunate. Coleah is twelve miles from Algiers near the sea, a thriving village. About fifteen miles westward of Medeyah are the hot springs of Mereega, the *Aquæ calidæ Colonia.* In the western province of Mascara is Shershel once Jol, the residence of Juba, afterwards called Julia Cesarea, a sea-port town most strongly and pleasantly situated; it has repeatedly suffered from earthquakes, but has yet some trade and manufactures of steel and pottery. A large tract in its neighbourhood is strewn with remains of its former magnificence, pillars, mosaic pavements, ruins of a large aqueduct, &c Mustigannim, a town of between 5000 and 6000 inhabitants, is built on the slope of a hill near the sea, in a very fertile and well-cultivated district: Arzew is the ancient Arsenaria, near which are valuable salt-pits which might be made more productive. Oran, or more properly Warran, is a coast town of from 10,000 to 12,000 inhabitants, and the common residence of the bey of the province. It is a fortified place, and carries on some trade by sea. The Spaniards were masters of it for near three centuries until 1792, as well as of the neighbouring Marsa el kebir, the Portus Magnus of the ancients, a natural harbour, one of the best on the coast of Barbary. Farther to the S.W., near the mouth of the river Tafna, are some remains of the ancient Siga or Sigeum, the metropolis of Syphax and other Mauritanian kings. About fifteen miles from it, in the interior, is the city of Tlemsen, the capital of the province, built on a rising ground below a ridge of rocky mountains which form part of the Atlas, in a fine and fertile country irrigated by a number of streams. The old Tlemsen, once the capital of a kingdom, was much larger than the present town, but was almost wholly destroyed in 1670 by Hassan Dey of Algiers. Tlemsen reckons still about 20,000 inhabitants, and is the third city of the regency, next to Algiers and Costantina. There are manufactures of carpets and blankets, and some trade carried on with the interior. It is not far from the borders of the Sahara, which here approaches very near the coast. Mascara, the ancient Victoria, once also the capital of the western province, now much decayed, is situated about thirty miles inland from the Bay of Arzew. Fifteen miles to the N.E. of Mascara is El Callah, a small town with several villages around it, built among the Atlas mountains, the population of which are busily employed in the manufacture of carpets, bournooses, and other woollens, for which El Callah is the chief mart in the whole regency.

The territory south of the Atlas, which is included within the limits of the regency of Algiers, consists of two great districts: the Zaab, or ancient Gætulia, which lies south of the provinces of Costantina and Titteri, between the Atlas and the Wad Adjedee river, and the Wad Reag, which is south of the latter and stretches to the very edge of the sandy desert. The town or village of Biscara, with a small castle and a Turkish garrison from Costantina, is the principal place in the Zaab. Dates are the chief produce of the country. The Biscareens are a tribe distinct both from the Arabs and the Kabyles, although believed to be of Arab descent; they have fixed habitations, are industrious, honest, and quiet. Many of them come to Algiers, where they are preferred as servants and porters, and where they have an amir or consul to settle their concerns. They have been confounded by Europeans with the other Kabyles. They are very dark; they profess Mohammedanism, and speak a dialect of the Arabic. The Biscareens trade with Soudan by the way of Ghadamis. The country of the Biscareens is watered by several streams from the southern slope of the Atlas which fall into the Wad Adjedee, the principal of which is the Wad Abeadh, that rises in the mountains of Auress in Costantina, and flows southward until it meets the Adjedee not far above the Melgigg.

Wad-Reag is another collection of villages like those of the Zaab, but south of the Adjedee and ranged in a N.E. and S.W. direction. The principal villages are Tuggurt, south of the Melgigg, En-gousah, and farther south-west, Wurglah, a populous place frequented by the caravans from Soudan, and Nadrama, on the edge of the Desert. These are the extreme limits of human fixed habitations. The Beni Mozab live to the westward of Wurglah, between 32° and 33° of latitude; Gardeiah, Beri-gan, and Grarah are their principal villages. They are a tribe of the Kabyles or Mazigh, have the same appearance and complexion, and speak the same dialect as their brethren, but are milder and more peaceful in their disposition; many of them live in Algiers, where they keep the public baths. They govern themselves as a republic, are independent of the regency, and they keep an amir at Algiers who was acknowledged by the dey. They reckon it twenty days' journey from their country to Algiers. Dr. Shaw sees in them a branch of the Melanogætuli of the ancient geographers. They grow a little barley, but their chief nourishment is dates. 'Their country,' says Dr. Shaw, 'is very dry, they have no fountains or rivulets, and in order to obtain water, they dig to the depth sometimes of 100 fathoms, through different layers of sand and gravel till they come to a flaky stone like slate, which is known to be immediately above the *Bahr taht el erd*, or 'the Sea below ground.' The stone is easily broken through, and the flux of water which follows the stroke rises so suddenly and in such abundance, that the person let down for this purpose has sometimes, though raised up with the greatest quickness, been overtaken and suffocated by it.' Among the numerous works on Algiers the following deserve mention: Shaw's *Travels in Barbary*, a very good topographical description of the country; Laugier de Tassy, *Histoire Générale du Royaume d'Alger*; Rehbinder, *Nachrichten und Bemerkungen über den Algierschen Staat*; Pananti, *Avventure ed Osservazioni sopra la costa di Barbaria*, a work too poetical in its style, but full of curious details and anecdotes; Shaler's *Sketches of Algiers*; Rozet, *Voyage dans la Régence d'Alger*, since the French occupation.

ALGIERS, the city of, in Arabic, *Al Jezira*, i.e., 'the Island, to which was added the epithet of *Al-gazie*, 'the warlike.' It was first built about 935 by Jussuf Zeri, an Arabian chief, of the Zeirite dynasty, which succeeded that of Aghleb in the sovereignty of the country. It is in the shape of an irregular triangle, of which one side is formed by the sea-coast, and the other two run up the declivity of a steep hill which faces the N. and N.E.; the houses rise gradually one above the other, so that there is scarcely one that has not the prospect of the sea from its terrace. The houses are square, and mostly two stories high; they have a closed court in the middle, on which, and not on the street, the windows of the apartments open. The flat terrace at the top is the resort of the family, especially in the evening, to enjoy the sea breeze. The buildings are all painted white, and the reflection of the sun from them is very painful to the eyes. The circumference of Algiers is little more than two miles; the streets are very narrow, the widest being only twelve feet in breadth. The population of Algiers was reckoned in 1830 at about 70,000, since which it has decreased at least one-fourth by emigration; of these, about 8000 were Jews, 1000 Christians, and the rest Mohammedans. There were thirteen great mosques with minarets, and about seventy small ones, belonging to private individuals. There was also a synagogue, and a chapel and hospital for the Christians; the latter was supported by the Spanish government. The Palace of the Pacha, called also the Jenina, is in the lower part of the town, but the late dey had his residence in the Casabah or citadel, at the highest point of the city. The other remarkable buildings of Algiers are the barracks, the light-house, the dock-yard, the principal bazaars, the mole, and the quays. The hills, which rise in the form of an amphitheatre around the city, are studded with country-houses, gardens, vineyards, and olive groves. Algiers is well supplied with water from a large reservoir, the water of which is conveyed from the country by an aqueduct, and then distributed by conduits all over the city. There are a great number of public baths, of small coffee-houses, and some wretched inns called *Fonducs*. The batteries which defend Algiers on the seaside are very strong, but the fortifications on the land side are weak and exposed. The castle called the Emperor's, which is outside the walls, commands the city, but is itself commanded by the upper part of Mount Boujereah. Below the Emperor's fort, a road leads from the Casabah along the inland skirt of Mount Boujereah to the point of Sidi Ferruch, about fourteen miles west. It was by this road that the French advanced, in June, 1830, to invest the Emperor's fort, which, after a brisk cannonade, was abandoned by the Turks on the 4th of July. The following day Algiers surrendered to General Bourmont, on condition that persons, private property, and the religion of the country should be respected, and that the dey and his Turkish militia should quit Algiers, carrying with them their personal property. The French took possession of the town, the castles, and all public property of every kind; among the spoil were twelve ships of war, 1500 bronze cannon, and 48,000,000 of francs in gold and silver. No mention was made of the provinces, nor of the future government of the country. Algiers lies in 36° 49′ N. lat., 3° 25′ E. long.



[Algiers, from a French survey.]

ALGONQUINS, the name of a tribe of North American Indians, or, rather, a kind of generic name, under which are included numerous native tribes, which are related to one another. The principal tribe of the Algonquin nation, at present, is the Chippewas. The Algonquins, even in their present depressed state, are spread over a large tract of country, from the shores of lakes Erie and Ontario to the neighbourhood of the Esquimaux. The term Algonquin is one of the three divisions, which the early French writers made of the native tribes, the Hurons and Sioux being the others. The Algonquin language is now spoken by the Chippewas, Ottowas, Potawatamies, Sacs and Foxes, Shawnese, Kickapoos, Menomonies, Miamies, and Delawares. These languages are said to approach to the Chippewa, which may be called the standard, in the order in which we have placed them.

When America was first discovered, the dialects of the Algonquin language extended from the Penobscot in Maine to the Chesapeake Bay, and from the Atlantic Ocean to Lake Superior. The tribe which is properly designated by the name of Algonquin was found on the banks of the Uttawas river, which enters the St. Lawrence near Montreal, and also on the north shore of lakes Erie and Ontario.

From the specimens given in Adelung's *Mithridates* of the Chippewa and Algonquin tongues, it cannot be doubted that they are the same languages. In the regions that extend from the Uttawas river, north and west, to Lake Winnipeg, the Saskatchevine river, and still farther, Adelung places the Knistenaux, a widely-spread tribe, whose language, if we may judge from the specimens given, is closely allied to the two just mentioned.

By comparing the specimens of the Knistenaux, Algonquin, and Chippewa languages, with a very copious Cree vocabulary, we have no doubt that the latter language is closely akin to all three. So vague, indeed, are the notices of Indian tribes, that it is quite possible that all the four names, which we have used, may, to a certain extent, represent the same nations or parts of the same nations. The Crees are now described as occupying the country between the 50th and 57th parallels of north latitude, and the 80th and 105th of west longitude, and are in fact geographically, as well as by language, part, at least, of the people called by Mackenzie the Knistenaux, and by Charleroix the Cristinaux or Kilistinous. The meaning and origin of the word Algonquins is, we believe, unknown. (See *North American Review*, No. L. Adelung's *Mithridates*.)

ALGOA BAY, known also as Port Elizabeth, and formerly called Zwartkop's Bay, is situated in Cape Colony, South Africa, in 33° 56′ south latitude, and 26° 53′ east longitude. This inlet, which is about twenty miles broad from east to west, is nearly five hundred miles eastward of Cape Town, between it and the newly-settled district of Albany.

The anchorage of Algoa Bay was surveyed in 1820, by Captain Moresby, of his Majesty's ship Menai. It is a good holding ground, and for six months of the year, when the north-west winds prevail, is perfectly secure, but during the remaining months a heavy sea rolls in from the south-east. The tide rises in the bay from six to seven feet. The shore is a level sandy beach; it receives the waters of the Zondag, Zwartkop, and Kowie rivers, and has besides some fine springs of water on the western side. The surrounding country forms part of the district of Uitenhagen.

Port Elizabeth was the place of debarkation for the emigrants who went from this kingdom to Cape Colony, in 1820; as many as 3659 individuals landed here in the summer of that year.

An establishment has been formed on the eastern coast of the bay for curing beef. This process can only be conducted from the beginning of May to the end of August, at which time the season is favourable, and the cattle are in good condition. It is expected that a considerable trade in this kind of provision may be carried on between the settlers and the Mauritius, as well as with vessels touching on their way from India, and eventually also with the West India Islands. It likewise appears probable that a fishery may be successfully prosecuted in the bay, which is much frequented by black whales. (*Report of the Commissioners of Inquiry upon the Trade of the Cape of Good Hope*:—Printed by order of the House of Commons.)

ALGUACIL, an officer in Spain answering to the English bailiff. The name is from the Arabic *el-vazil*, or from the Hebrew verb *gazal*, which means to catch. His duty is to take into custody, and execute criminals in the court of the king at the command of the judges. In case of any quarrel or disturbance he has the power to take any person into custody, and deliver him up to the authorities. The common alguacils are appointed by the judges. The *alguacil mayor* is a superior officer, whose functions are the same as those of the common alguacil. He is appointed by the common council, of which he is a member. The duty of an alguacil is at present confined to the apprehension of criminals; the office of executioner being discharged by the *verdugo*.

[See *Partida*, II., ley, xx. tit. ix., and Covarrubias, *Tesoro de la Lengua Castellana*.]

ALHAMA, Artigis Juliensis, a town of Spain in the kingdom of Granada. Its present name is from the Arabic article *al* and *hammiyat*, 'warm baths.' It is situated upon an eminence detached from the chain of Zafarraya, and about a mile from it are the baths, which consist of two ponds. The smallest of them is called De la Reina. The water is hard, clear, and sulphureous, and has an oily taste. When the sun-light falls upon it, an unctuous substance is perceived on its surface, which has the appearance of oil. In cold weather a sort of mist rises from the water, which deposits in the pipes through which it flows a white substance resembling soap. These baths are inclosed in a building of freestone which has nothing remarkable in its appearance. The Moors derived a great profit from these baths; some authors make it amount to 500,000 ducats.

Owing to its situation, this town is in the winter months covered with snow, and in summer scorched by a burning sun. It contains one parish, two convents of monks, and one of nuns. The population amounts to 6000 inhabitants. It is fifteen miles south-west of Granada. (See Miñano.)

ALHAMA. There are two other towns in Spain, perhaps more, which derive the name of Alhama from having mineral waters.

ALHAMBRA, an antient castle and palace of the Mohammedan kings of Granada. It was built by Mohammed II., about the year 675 of the Hegira, or 1273 of our æra. He gave it the name of *Medinet Alhambra*, or the Red City; according to some writers on account of being made of a kind of red clay, but according to others, from the name of the tribe of Mohammed Alhamar. The Alhambra walls are built of a kind of cement of red clay and large pebbles, which being exposed to the air acquires the hardness of stone.

The exterior of the castle presents nothing very striking. The Arabs heaped up their buildings without order, regardless of their exterior appearance, and sought only internal convenience and comfort. The Alhambra is situated on a hill, which runs out to the east of the town of Granada. It is surrounded by a strong wall, flanked by square towers, and inclosing an area of 2500 feet in length and 650 in breadth. It is said that 40,000 men could be conveniently lodged in it. The walls follow all the windings of the mountain, and are constructed according to the best rules of fortification in the middle ages; before the invention of gunpowder it must have been impregnable. The river Darro flows by the base of the hill, on the east, north, and west. In this limited space the kings of Granada had united everything calculated to afford security in time of war, and comfort and pleasure in time of peace.

The easiest ascent is by the street of the *Gomeles*, so called from a distinguished Moorish family of that name. In coming out of the *Puerta de las Granadas* or 'pomegranate gate,' the road is divided into three, the middle one for carriages, and the other two, which are very steep, for foot travellers. The middle road ascends, between the hills of the Alhambra and *Torres Bermejas*, through a very thick wood of lofty elms, the branches of which are so interlaced that the rays of the sun never penetrate their thick foliage. Innumerable clear rivulets glide through the forest irrigating the ground, which is covered with verdure, or fall from rock to rock forming a number of beautiful cascades. Near the summit of the hill is the fountain of Charles V. on a sort of natural terrace, from which there is a bird's-eye view of all the ascent, which amply repays

[Gate of Justice, from Murphy's Arabian Antiquities of Spain.]

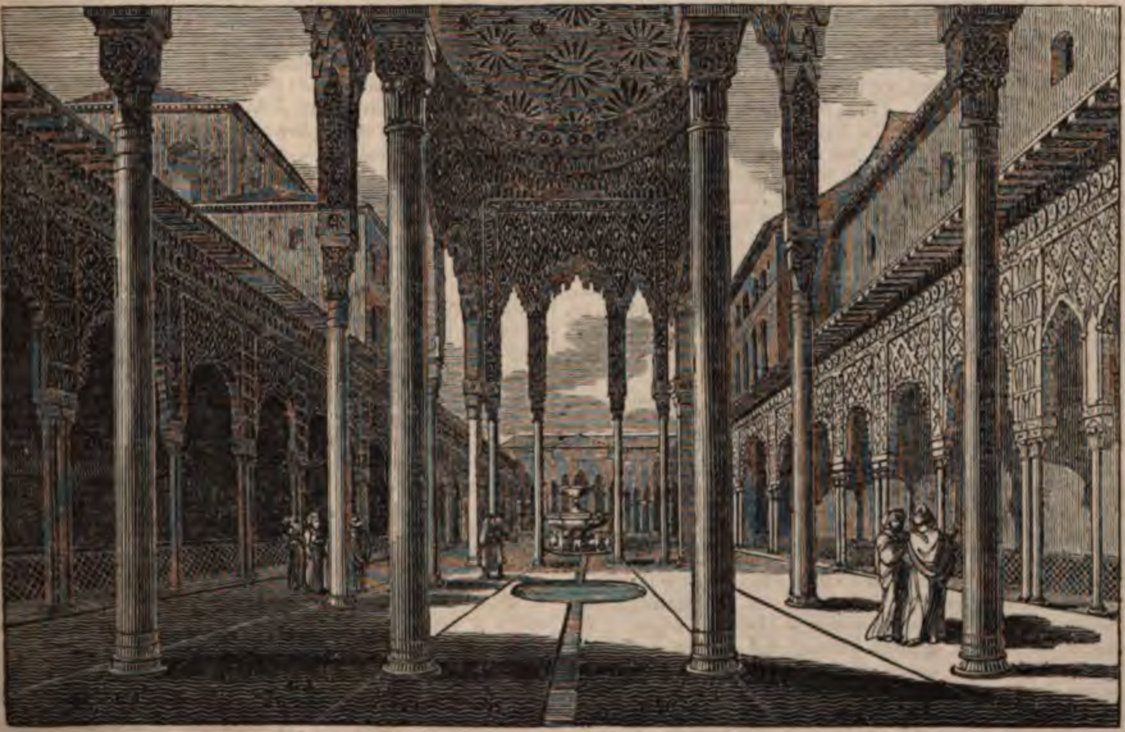
for the fatigue. After passing this fountain the traveller comes in sight of the Alhambra gate, called *Judiciaria* or of Judgment, because justice was administered there after the custom of the East. It is a square tower, the horseshoe arch of which rises to half the height of the tower, and is a perfect model of this kind of arch, so characteristic of Arabian architecture. Upon a stone in this tower is the following inscription in Arabic, which is thus rendered by James Murphy. 'This gate, named Babu-sh-shariāt, may God prosper through it the law of Islam, even as He has established it a monument of glory, was built at the command of our Lord, the commander of the Muslims, the just sultan Abu-l-Hajjàj, son of our Lord, the warlike sanctified (deceased) sultan Abu-l-Walid ebn Nasr, whose pious deeds for religion may the Almighty recompense, and whose valorous performance in the cause of the faith may He graciously accept. And it was completed in the month of the glorious birth of Muhammad, in the year 743 (1348). May Heaven constitute it a protecting bulwark, and reckon it among the lasting actions of the righteous!' We then enter the porch which winds along the barbican, and leads to the *Plaza de los Algibes*, or square of the cisterns. These are two in number, the largest of which is 102 feet long and 56 wide; it is arched over, and inclosed by a wall 6 feet thick. The principal arch is 47 feet wide in the centre, and is 17 feet below the ground: in these cisterns the water deposited its sediment, and was kept cool for the use of the castle.

On the east side of this Plaza is the palace of Charles V., a beautiful specimen of the *cinquecento* style, by the famous architect Alonso Berreguete. On the north is a very simple and unostentatious entrance to the *Mesuar*, or common bathing court, the first of the Moorish palace. On entering it the visiter feels as if magically transported into one of the fairy palaces described in the *Arabian Nights*. The *Mesuar* is an oblong court 150 feet in length and 56 in width. It is paved with white marble, and the walls covered with arabesques of admirable workmanship. The inscription, *Wā lā ghalib illa-lla*, that is, 'God alone is conqueror,' which is often repeated throughout the building, is read on the peristyles at each end of the court. In the midst of this court is a basin sufficiently large to swim in, bordered with parterres of flowers, beds of roses, and rows of orange trees. This court was designed as a common bath for servants and other dependents of the palace, and supplied with water the fountains of the other apartments.

At the lower end of the Mesuar is an archway leading to the *Patio de los Leones*, or lions' court, which may be considered as the type of Arabian architecture. It measures 100 feet by 60, and is paved with white marble. In the centre of it is a large basin of alabaster supported by twelve lions, not in the best taste. Over this basin a smaller one rises, from which a large body of water spouts into the air, and falling from one basin into the other is sent forth through the mouth of the lions. This court is surrounded by a gallery supported by a great number of slender and elegant columns, 9 feet high, and 8¼ inches in diameter. These columns are very irregularly placed, sometimes they are single, and sometimes in groups of two or three. The walls, up to the height of 15 feet from the ground, are covered with blue and yellow mosaic tilings. The peristyles and ceiling are beautifully ornamented with arabesques and fret-work in the most exquisite taste. Around the upper face of the fountain of the lions are some Arabic verses, which describe in a style of oriental hyperbole the wonders and the beauty of the fountain.

On each end of the court projects a sort of portico or gallery, supported likewise with light marble columns.

On the left side of the court of the lions is the *Sala de los Abencerrages*, where the cicerone never fails to show the blood of these brave warriors, which, however, is nothing else but the deposit of the water impregnated with iron on the white stone.



[Court of the Lions, from Murphy's Arabian Antiquities of Spain.]

Opposite to the *Sala de los Abencerrages*, on the other side of the court of the lions, is the *Sala de las dos Hermanas*, or Hall of the Two Sisters; so called from two huge flags of white marble, without a flaw or stain, which are in the pavement. On the upper end of the Mesuar arises the magnificent tower of Comares, so called from a delicate work named *comaragia*. This massive tower rises above the rest of the building, and overhangs a deep ravine, which descends almost perpendicularly to the river Darro. The prospect from this tower is truly magnificent. The delightful valley through which the Darro flows, part of the city of Granada and of its beautiful vega (plain), present an enchanting natural panorama. The *Sala de Comares* was undoubtedly the richest in the Alhambra, and still preserves traces of its past splendour. The walls are richly stuccoed and ornamented with arabesques of such exquisite workmanship, that the most skilful artists would be greatly embarrassed to imitate it. The ceiling is of cedar-wood, inlaid with ivory, silver, and mother of pearl. The three sides of the hall are full of windows, formed in the immense thickness of the wall, which thus allow a free circulation to the air, and admit a faint light which produces a surprising effect. In the same manner all the halls of the Alhambra are lighted and ventilated, On the east of the *Sala de Comares* is the *Tocador de la Reina*, or Queen's Toilet; in a corner of this apartment there is a stone drilled full of holes, through which ascended the smoke of the costly perfumes burnt beneath. Close by is the charming little garden of Lindaraja with an alabaster fountain, and groves of roses, myrtles, and orange trees.

At a short distance from the Alhambra rises the *Cerro del Sol*, or 'Sun Mountain,' on which the *Generalife* is situated, a villa where the Mohammedan kings spent the summer months. The palace of Generalife is built in the same style as the Alhambra. Its situation is highly picturesque. The views are all varied, and all charming. We see here fountains spouting above the loftiest trees, numerous cascades, terraces placed in amphitheatre, and the immense cypresses and the ancient myrtles which once overshadowed the kings and queens of Granada. Among them is distinguished the cypress of the *Reina Sultana*, under which the queen was surprised with her beloved Abencerrage, as the romance says.

When we examine the halls of the Alhambra, we are no less surprised at the elegance of their construction and the beauty of their ornaments than at the durability of a work of such a delicate nature. It appears, indeed, incredible that, after a lapse of nearly five centuries, its fountains should continue to play; the blue, the carmine, and the gold, should preserve all their brilliancy and freshness; its slender columns and apparently fragile fillagree work should have stood the vicissitudes of time, and the terrible shocks of earthquake to which this place is subject.

The Alhambra has a governor, who generally lives at Granada. It is guarded by a body of *invalidos*, or retired veterans, who serve as guides to the visiters.

See Swinburn's *Travels in Spain*, letter xiii. Colmenar, *Délices de l'Espagne*, vol. iii. James Murphy's *Arabian Antiquities of Spain*.

ALHAMBRA, more properly Alambra, a small town of Spain, in the province of La Mancha, eleven miles north of Villa-Nueva de los Infantes. It contains many inscriptions and other antiquities belonging to the Roman period; and there can be little doubt that it marks the site of the town called by the Romans Laminium. The letters *min*, in the middle of a Roman word, generally appear in the Spanish in the form of *bre* or *bra*. Thus, *hominem*, a man, *femina*, a woman, were changed by the Spaniards to *hombre*, *hembra*, respectively. The present town, Laminium, would thus naturally be altered to *Lambra*, which with the Arabs would almost certainly become Alambra, or Alhambra; the more so as in this form it would have a meaning in the Arabic language, like the Al-hambra of Granada. Alambra is in 38° 59′ N. lat. 2° 59′ W. long. Population 734. Pliny, Ptolemy, and the *Antonine Itinerary* mention Laminium.

ALHAZEN, or ALLACEN, properly AL-HASSAN, or, with his complete name, ABU ALI AL-HASSAN BEN AL-HASSAN BEN HAITAM, a distinguished mathematician, who lived during the earlier part of the eleventh century. He was a native of Basra. Relying upon his skill in mechanics, he had declared, that he would engage himself to construct a machine by means of which the inundations of the Nile could be made productive of the same advantage, whether they exceeded or fell short of the average height. The Fatimide caliph, Hakim biamr-allah heard of this, and sent for Al-Hassan, on whom he bestowed rich presents, hoping that he would fulfil his engagement. But when Al-Hassan had made himself better acquainted with the nature of the river, he perceived that he had undertaken an impossibility, and in order to avoid the consequences of Hakim's anger at his disappointment, he feigned insanity till Hakim died (A.D. 1020). He lived at Cairo, where he supported himself by copying books, and devoted his leisure hours to study and original composition. He died A.D. 1038. A long list of his works may be found in Casiri's *Bibliotheca Arabico-Hispana Escurialensis*, vol. i. p. 415. A treatise on optics, by Al-Hassan, was translated into Latin by Risner, and printed at Basil, under the title of *Opticæ Thesaurus*, in 1572.

ALI BEN ABI TALEB, surnamed by the Arabs *Asad Allah*, and by the Persians *Shir-i-Khoda*, i. e. the Lion of God, was the fourth caliph or successor of the Arabian prophet Mohammed in the government of the new empire founded by him, and occupied the throne during the years 35-40 after the Hegira (A.D. 655-660). He was the cousin-german of Mohammed, and had from his childhood lived under his care and protection. When the latter announced himself as a prophet, Ali, then ten or eleven years old, was, according to tradition, the first man who acknowledged his divine mission. From these circumstances, and also on account of his marriage with Fatima, the daughter of Mohammed, Ali appeared to have strong claims to the commandership over the Faithful, when the prophet died (A.D. 632) without leaving male issue. Three other associates of the prophet, Abu Bekr, Omar, and Othman, were, however, successively appointed caliphs, before Ali came to the throne, (A.D. 655;) and his son Hassan, who succeeded Ali in 660, was in the ensuing year obliged to resign the government to Moawia, the first caliph of the Ommaiade dynasty. The controversy concerning the respective rights of Abu Bekr, Omar, and Othman, on the one side, and of Ali ben Abi Taleb and his lineal descendants on the other, has given rise to the schism of the Sunnites and Shiites in the Mohammedan community. [See ABU BEKR.] The commencement of the troubles arising from this division disturbed the reign of Ali himself. His predecessor Othman had been killed during a revolt at Medina, where a number of malcontents from different parts of the empire were assembled; those from Egypt succeeded in elevating Ali to the caliphat. Two of his competitors, Zobair and Talha, at first acknowledged him, with feigned submission, as sovereign; but when Ali refused to appoint them governors of the important towns of Basra and Kufa, by the inhabitants of which their claims to the caliphat had been chiefly supported, both deserted him, and in common with Ayeshah, the still surviving widow of Mohammed, formed a strong party against Ali. They had already made themselves masters of Basra, when Ali, at the head of an army of 30,000 men, defeated them in a battle near Khoraiba (A.D. 656). Talha and Zobair were killed: Ayeshah, who had been present at the conflict, was taken prisoner and sent to Mecca.

New disturbances soon arose at Damascus, where Moawia, a near relative of Othman, had by a strong party been appointed *Amir* or chief. Ali encountered him near Saffein, (A.D. 657,) in the neighbourhood of which place nearly a whole year was consumed in skirmishes between the two armies, but no decisive battle ensued. At last the two opponents agreed to withdraw, Ali to his residence at Kufa, and Moawia to Damascus; the former appointing Abu Musa al-Ash'ar, and the latter Amru ben al-As, as delegates to arrange the controversy in a peaceable convention at a place called Dumat-al-Jondal, between Syria and Irak. This measure excited much dissatisfaction among the adherents of Ali, many of whom blamed the caliph for having submitted to the discretion of mortals the settlement of a dispute which, in their opinion, ought to have been left entirely to the decision of Providence and to the chance of war. The discontented, who on this account seceded from Ali, assembled at Naharvan under the command of Abdallah ben Waheb: most of them were, however, dispersed after a decisive battle, (A.D. 658,) in which Ali was victorious.

The caution with which the governor of Egypt, Saad ben Kais, had conducted himself during the disputes between Ali and Moawia, rendered him suspected by the caliph. Ali removed him, (A.D. 658,) and appointed as his successor, Mohammed, the son of Abu Bekr, who behaved with such rigour towards the adherents of Moawia, that much discontent was excited in Egypt. Moawia availed himself of this opportunity to send an army under the command of Amru ben al-As into Egypt, who vanquished and killed Mohammed. Soon afterwards Moawia took possession also of Basra, which Ali's governor, Zayyad, made but a feeble effort to defend. Abdallah ben Abbas, however, reconquered that town for the caliph.

The next year (A.D. 659) passed by without any military operations. But in A.D. 660 Moawia sent an army under the command of Bosr ben Artha into Hejaz, who took possession of the two sacred cities, Mecca and Medina, and on his return defeated and killed Abdallah ben Abbas, the governor of Basra.

About this time three of the zealots of Naharvan, Abdorrahman ben Moljam, Borak ben Abdallah, and Amru ben Bekr, with the design of restoring unity and peace in the Mohammedan empire, entered into a conspiracy to murder the governor of Egypt, Amru ben al-As, the caliph Ali, and Moawia. Amru ben al-As and Moawia escaped, but Ali was struck by Abdorrahman ben Moljam with a poisoned sword in his residence at Kufa, and died after three days, (A.D. 660,) at the age of fifty-nine, or, according to others, sixty-five years.

Ali had by Fatima three sons, Hassan, Hossam, and Mohsen: the latter died very young. Hassan succeeded his father for a short time in the government, and with him terminated, according to Arabic historians, the *legitimate* caliphat, *i. e.* the succession of those caliphs who had been appointed by the free choice of the Faithful. [See Abu Belba.]

ALI HYDER. [See Hyder Ali.]

ALI PACHA, a celebrated Albanian chief, was born about 1750, in the little town of Tepelen, in the pachalik of Berat, on the left bank of the river Voioussa, the ancient Aous, at the foot of the Klissoura mountains. Ali's family was distinguished by the name of Hissas, and had been for ages settled in the country; it belonged to the Albanian tribe or clan of the Toske or Toxide, who boast of being old Mussulmans. One of Ali's ancestors, after being for some time a klephtis, or highway-robber, made himself master of Tepelen, and assumed the title of Bey, holding it as a fief of the pacha of Berat; this acquisition became hereditary in his family. Ali's grandfather distinguished himself in the Ottoman service by his bravery, and was killed at the siege of Corfu against the Venetians, in the beginning of the eighteenth century, while in the act of mounting the rampart and calling to his men to follow him. His sword was preserved as a trophy in the arsenal of Corfu until the French occupation of that island in 1797. His son Vehli Bey, the father of Ali Pacha, was a good, quiet, liberal-minded man, very partial towards the Greeks. The neighbouring beys or feudal Albanian chiefs combined against him, and deprived him of the greater part of his estates. Vehli, unable to resist, died of grief, leaving two sons, one by each of his two wives, and one daughter. The mother of Ali and of his sister Shynitza, a woman of masculine courage, but cruel disposition, having got rid of her rival and of her rival's son by means, as it was said, of poison, secured the succession to her own son Ali, then fourteen years of age. Young Ali accompanied his mother, who put herself at the head of the little band that remained attached to the Hissas family, keeping at bay her enemies, making incursions into their territories, and practising all the stratagems of Albanian clan warfare; for that country, although nominally subject to the Porte, is still in a condition somewhat similar to that of the Highlands of Scotland a century or two since.

Ali at times sought adventures on his own account as a klephtis. With 'sixty paras in his pocket, and his trusty gun,' as he used in after times to boast, he sallied from home, and roamed about mountains and valleys, and thus acquired that minute knowledge of the topography of his own country which proved so useful to him in his subsequent career. But a cruel event soon plunged Ali's family in misery and shame. The inhabitants of Gardiki, a town in the mountains near Argyro Castro, made an attack by night on Tepelen while Ali was absent, and surprised both his mother and sister. The two women were taken to Gardiki, where they were kept strict prisoners for a month, and given up to the brutal lust of the inhabitants in succession. At last, through the agency of some individual more humane than the rest, they were released from their dreadful situation. This event had probably a great influence on Ali's disposition. The cruelty of his enemies soured his disposition, and inspired him with that thirst for sanguinary revenge which became a leading feature of his character. His mother and sister were frequently urging him to remember the insult offered to them, and the former, on her death-bed, enjoined him not to rest until he had exterminated the whole race of the Gardikiotes. This wish was not fulfilled till many years after, when Ali, being at the summit of his power, *remembered* Gardiki. Surrounding the town with numerous troops, he obliged the inhabitants to surrender at discretion, and carefully picking out all those who had participated in the outrage against his mother and sister, together with their families, he had all the men killed, and the females sold as slaves. The tresses of the latter served to stuff the cushions of Shynitza's divan.

Ali, after the mishap above mentioned, raised a band with which he carried on a desultory and predatory warfare against his enemies. He was, however, at first unsuccessful, and being reduced to great difficulties for want of money, often wandered alone in the mountains not knowing where to seek for shelter. On one of these occasions, as he afterwards related to the French General Vaudoncourt, 'he was sitting under the ruins of a convent, bitterly reflecting on his desperate situation, and mechanically sounding the ground with his stick, when he suddenly thought he felt something resounding underneath. He dug the earth and found a small coffer full of gold, buried there probably during former civil wars. With this money he raised 2000 men, and re-entered Tepelen in triumph.' He now made a vigorous effort to recover the whole of his father's possessions. His mother accompanied him in his campaign. The neighbouring Beys of Argyro Castro, Gardiki, Kaminitza, Ziormovo and others, united against him, defeated him, and drove him into the mountains with a small remnant of his men. This was the critical moment of Ali's life. He took a sudden resolution. Being informed that his two most powerful enemies, the Beys of Argyro Castro and Gardiki, had quitted their confederates and returned home, he left his place of concealment in the middle of the night, unknown to his mother, and proceeded alone to the camp of his enemies, and at day-break presented himself to the leaders. 'The fate of Ali is in your hands,' said he to them; 'you may destroy me, but remember that my death now will not be of any benefit to you. The Beys of Argyro Castro and of Gardiki aim at domination over all our country; my fall will only remove an obstacle to their views. The strong hold of Tepelen, still in the hands of my brave men, might, if you were to unite with me, arrest their ambition. You may choose, but be sure that my ruin will only lead to yours.' The Albanians, like the Arabs, have high notions of hospitality, at least while in their own country, and he who voluntarily puts himself under their protection is generally safe. Ali's reasoning made an impression on them, and from being his enemies they became his allies. His mother, who, on discovering his flight, thought him lost, met him soon after at the head of the united tribes. Ali was now a powerful chief, but his band having committed many depredations about the country, attracted the notice of Koort, Pacha of Berat, who marched against him and took him prisoner. His youth, and his comeliness, however, gained him favour with the Pacha, and it was whispered also with the Pacha's daughter. But the Pacha was a proud man; his family—for the Albanians, unlike the Turks, have a great regard for genealogies—was traced back to a long list of viziers, and even, it was pretended, to the great Scanderbeg himself. Ali, compared to him, was but an adventurer, a klephtis. The Pacha therefore dismissed his prisoner with presents, and gave his daughter in marriage to Ibrahim Bey, who afterwards succeeded to the pachalik of Berat. Hence, perhaps, arose the implacable hatred subsequently manifested by Ali against Ibrahim. Ali, continuing his predatory career, fell next into the hands of the Pacha of Jannina, and was near being executed in the very city which afterwards became his capital. But the Pacha thought better of the matter, and as he was himself surrounded by hostile neighbours, he made a friend of Ali, who was in return to serve him against his enemies. Ali served him so well that numerous complaints reached the Porte of the incursions and depredations committed by his band The Porte ordered the Derwend Pacha, who has the inspection of the high roads of Roumily, to exterminate this troop of robbers. The Derwend Pacha of the time happened to be no other than the old Pacha of Berat, Ali's friend. The sequel is easily guessed. An interview took place between the two chiefs, and Ali, withdrawing his Arnaouts from the high roads, took service under the Pacha, who wrote a favourable account of him to Constantinople, and obtained his forgiveness. But an intrigue of Ali with the former object of his attachment, the Pacha's daughter, now married to Ibrahim, obliged him to decamp suddenly in order to save his life. He then entered the service of the Pacha of Negropont, where he accumulated great wealth. Ali's career as klephtis, or chief of high-road robbers, which he had followed for ten years, was thus terminated. Having returned to Tepelen he married the fair Emineh, daughter of Kasselan the rebel Pacha of Delvino, who had established himself as an independent tyrant in the stronghold of Argyro Castro. Kasselan, however, was soon after decapitated by order of the Porte, and his successor married Shynitza, Ali's sister, but was afterwards murdered by his brother Solyman, who married the young widow. By these events the wealth of Kasselan came into Ali's family.

Ali, however, was not yet undisputed master in his own country of Tepelen. Other beys or chiefs existed in or about the place, whom he knew to be his enemies. He charged some of his trusty friends to get up a sham conspiracy against him, which the others were easily persuaded to join. It was agreed that Ali was to be murdered in a wood where he used to rest after hunting. Ali had a goat tied on the spot, and his cloak thrown over it. At the appointed time, the conspirators came and made a discharge of their muskets at the unfortunate goat. Ali had posted some of his men near the place, who, starting up, frightened the conspirators away before they had time to perceive their error. Thinking that they had killed Ali, they entered Tepelen in triumph, shouting out that he was dead, and then went to their house to carouse upon the event. Ali, concealed in his mother's harem, waited until the night was far advanced and his enemies were intoxicated, when, sallying forth at the head of his faithful band, he exterminated all his antagonists, divided their houses and property among his friends, and from that day he was sole master of Tepelen: such is the account Ali afterwards gave of this exploit. He next conquered various districts which he united to his dominions. Several tribes, overawed by his successes and terrified by his ferocity, voluntarily submitted. His riches now gave him the means of intriguing at the Porte. He obtained the secret commission of executing the 'firmaun of death' against Selim, Pacha of Delvino. He insinuated himself into the good graces of the latter, and having thus introduced some of his own men into the palace, he took him one day by surprise, had him beheaded on the spot, and then silenced the Pacha's guards by unrolling before them the sultan's firmaun. In reward for this service he was appointed lieutenant to the new Derwend Pacha of Roumily, in which office he enriched himself by sharing with the klephtis the produce of their spoils. In consequence of this traffic, the roads soon swarmed with robbers; repeated complaints reached the Porte, and the Derwend Pacha was recalled and beheaded. The lieutenant also, being summoned, instead of appearing, sent presents to several members of the divan, and thus evaded punishment.

Ali's reputation for bravery and decision was, however, established at Constantinople, and when the war broke out in 1787, between the Porte and the two courts of Austria and Russia, he was appointed to a command in the army under the vizier Jussuf. Having distinguished himself in the field, he was next appointed to the pachalic of Tricala in Thessaly, and was moreover named Derwend Pacha of Roumily. He now raised a body of four thousand men, all Albanians and all old klephtis, with whom he soon cleared the roads of robbers, and thus won merit with the Porte. He now turned his views towards Jannina, the capital of southern Albania or Epirus, where utter anarchy prevailed. The pacha of Jannina had but a nominal authority, which the beys of the country openly disregarded, while they were continually quarrelling among themselves. Ali, in his pachalic of Tricala, was master of the road leading from Constantinople to Epirus, by which Jannina is supplied with corn from Thessaly. Ali made war on the beys, and when these obtained a firmaun from the Porte enjoining him not to interfere in matters concerning Jannina, Ali stopped and bribed the messengers, and substituted a forged firmaun appointing himself to the command of Jannina, with orders to all to submit to his injunctions. Ali followed close upon this document with a numerous force. Assisted by his friends in the town, he entered it and took possession of the citadel; he then assembled the Greek primates and the aga of the Mussulmans, and made them sign a petition he had drawn up, in which the whole population of Jannina was made to entreat the sultan to grant them as pacha the valiant Ali, the terror of robbers, the protector of public order, and the most zealous and faithful subject of his highness. This petition, being forwarded to Constantinople and supported by Ali's agents with ready money, produced its effect. Ali was confirmed in the pachalic which he had usurped. By a vigorous despotism he extinguished all factions, restored tranquillity, and the people were satisfied with the change; the Porte, seeing this so long a turbulent province reduced to subjection, forgave Ali for a deception of which the divan had been apprized only when it was too late.

Ali extended his dominion over all Epirus, and also into Acarnania and Ætolia or western Greece, by successfully attacking the revolted Armatoles or Greek militias who, under the corrupt and supine Turkish government, infested instead of protecting the country. But Ali was shackled on the sea-side of his dominions. The republic of Venice held of old on the coast of the Adriatic and the Gulf of Arta several strong places, such as Prevesa, Vonizza, Butrinto, and Parga. The Venetian senate had even obtained from the Porte in 1788 a firmaun forbidding the Pacha of Epirus constructing any battery within a mile of the coast, even of his own gulf of Ambracia. These stipulations were maintained as long as Venice remained free; but when that ancient state fell by the hands of the French in 1797, and the latter, in their sharing the spoils with Austria, kept for themselves the eastern possessions of the republic, Ali, while he was deceiving the French by professions of friendship, represented to the Porte that neither justice nor prudence required the fulfilment of former treaties with Venice in favour of the usurpers of Venice: accordingly he attacked one after the other the places on the coast. Parga, however, was protected by its impregnable position and the watchfulness of its inhabitants. The French garrison of Butrinto withdrew in time, but the fall of Prevesa was attended with circumstances of aggravated horror. Ali with a large force invested the French, who to the number of 700 were encamped on the site of Nicopolis. Some auxiliaries from Prevesa being broken in upon by the Albanian cavalry, the French were separated, and although vastly outnumbered, fought desperately until reduced to about 100 men, who, from exhaustion, were obliged to surrender. Meantime the Albanians had surprised Prevesa and entered the town, where a dreadful carnage took place. The small French garrison was cut to pieces fighting in the streets; the houses were set on fire, the surviving inhabitants, men, women, and children, to the number of about 400, were taken to the island of Salagora and there butchered without mercy. The French prisoners, after innumerable insults and ill-treatment, were marched to Jannina, and thence all the way to Constantinople; most of them perished on the road. The catastrophe of Prevesa happened in October, 1798. As for Parga, it was successively garrisoned by the French, the Russians, and the English, until, at last, in 1818 it was given up to Ali in consequence of a treaty with the Porte. Ali was also very desirous of obtaining a footing in the Ionian islands, and he intrigued first with the French, and afterwards with the English for this purpose; he even attempted to take Santa Maura by surprise, but he was baffled in his schemes.

Another war of extermination was that which Ali waged against the mountaineers of Souli. It has been called the ten years war; it began in 1792, and ended in 1803, by the destruction of the Souliotes. This Christian population had lived independent for more than a century in four villages, among almost inaccessible mountains, about six hours distance from Gardiki. They numbered only between 500 and 600 families, and could muster about 2000 fighting men; and yet this little band had kept at bay the power of all the successive pachas of Epirus. They had been attacked repeatedly by large forces, but had always repulsed their enemies. The neighbouring districts, and even some of the Mussulman beys, secretly favoured them. Ali could not think of leaving this rallying point for the disaffected of his dominions, almost within sight of his capital. He attacked them, but was beaten like all his predecessors. His hostility now assumed more the character of malignant rage, and he vowed the total extermination of the Souliotes. For years he steadily pursued his plan, which was to cut off all their communications and supplies, and starve them in their mountains; which he effected by surrounding them with a chain of forts guarded by a numerous army. He found means of seducing one of their chiefs, Georges Botzari. The Souliotes were reduced to the last extremities: despair and the bribes of Ali did the rest. Some of the defiles leading to Souli were given over to the pacha, and he was enabled to take possession of the springs from which they drew their water. At last the poor Souliotes were compelled from sheer necessity in December, 1803, to listen to proposals on the part of Ali, proposals which he of course had no intention of keeping. The Souliotes agreed to give up their towns and territory, on condition of being allowed to retire with their arms and all they could carry wherever they chose. The main body immediately took the road to the sea-coast at Parga, knowing that every moment's delay was pregnant with destruction to them. But there were other detachments of Souliotes scattered about who could not rally in time. Ali's soldiers fell upon these, and the scenes that followed were dreadful. None of the Souliotes surrendered; they all perished. In one instance, a small party, being completely surrounded, retreated towards a precipice, the women leading the way; being arrived on the brink, they first threw their children into the abyss below, after which they all, husbands and wives, fathers and sons, brothers and sisters, linked hand in hand, ran down the declivity, and mutually impelled each other into the precipice, in sight of their disappointed enemies. Another band, in like manner, pressed by a body of Albanian cavalry, plunged into the river Acheron and were drowned. The main body, who had marched off to Parga, left behind some men to act as commissaries in delivering the stores into the hands of Ali's agents, agreeably to the capitulation. These men's lives were, of course, guaranteed by the treaty. One of them, a priest, Samuel by name, was left in charge of a powder magazine. The Albanians came in, and began to taunt him with the prospect of the ingenious torments he had to expect at the hands of the pacha as a reward for his obstinacy. Samuel listened coolly, and when he saw the store-room nearly filled with Albanians, he threw the burning snuff of a candle on some powder which was scattered about, and blew up the store-house with himself and his enemies together. The Souliotes who had gone off to Parga reached that place in safety, though pursued by Ali's cavalry, and there embarked for Corfu, at that time occupied by the Russians.

Ali extended his dominions to the north into Albania Proper, by the conquest of the pachalik of Berat, which he effected more by intrigues than by force. Stirring up revolts, and then stepping in as mediator, he dispossessed his old rival Ibrahim, whom he consigned to a dungeon, although their children had intermarried. He likewise occupied the government of Ochrida in Upper Albania, by joining in the attack ordered by the Porte against the rebellious pacha of Skodra, or Scutari, and then kept it for himself. By this means he ensured an excellent military position on the side of Macedonia. The Porte was obliged to wink at these usurpations. Ali was even appointed for a twelvemonth Roumily-Valicy, or supreme inspector of the principal division of the empire, and he went to reside at Monastir, at the head of 24,000 men. His extortions in Roumilia were very great. His own dominions in the latter part of his life extended over all Epirus, one-half of Albania Proper, part of Thessaly, and the whole of western Greece, from the lake of Ochrida on the north, to the gulf of Lepanto on the south, and from Mount Pindus to the Adriatic. Ali was now Vizier or Pacha of three tails: his second son, Veli, was made Pacha of Morea; and his elder son, Mouktar, a thorough soldier, distinguished himself in the service of the sultan during the campaign of 1809, against the Russians. The youngest of all, Salih Bey, who was his father's favourite, and destined to succeed him, was brought up with particular care under good tutors and teachers. Veli Pacha was also a man of some information, and his son Mahmood, who was brought up at his grandfather's court, surprised Lord Byron by his inquiries about England and the English parliament. He was then a boy of fourteen.

Ali Pacha, although hated by the Porte, might have ended his days in peace; his power made him feared, and his advanced age was an inducement to the sultan to wait patiently for his natural death. But an act of daring atrocity on his part brought summary vengeance on his hoary head. One of his confidants, named Ismael Pacha Bey, having incurred Ali's deadly displeasure, had taken refuge at Constantinople, where he had ingratiated himself with the sultan, and had obtained an appointment in the seraglio. Ali, furious on hearing this, hired assassins to murder him in the midst of Constantinople. The attempt failed, and the assassins being arrested, confessed the name of their employer. The sultan was now roused; Ali was excommunicated, and all the Pachas of Europe were ordered to march against him. This was at the beginning of 1820. But the first campaign of the Ottomans against the outlawed Pacha was, as usual in such cases, unsuccessful. At last Kourshid, then Pacha of Morea, was ordered to take the command of the army against Ali in January, 1821. Kourshid laid siege to Jannina, but the Greek revolution, which broke out about this time, and which was secretly favoured by Ali, delayed and embarrassed his operations. Kourshid however persevered, and Ali, unable to defend his capital any longer, took refuge in a castle which he had built on an abrupt peninsula jutting into the lake, where he kept his principal treasures. Here he threatened to blow himself up unless he received the sultan's pardon. This was at last said to be granted, and Ali surrendered. But he was now doomed to experience the same perfidy which so many others had experienced at his hands. He had still his own officers around him, when some of the beleaguering Pachas came to show him the firmaun of death. Ali fired his pistols, wounded Hassan Pacha, and killed two more, but he was shot himself by the selictar of Kourshid Pacha, and fell crying to one of his attendants to go and kill his favourite concubine, 'that her charms might not be abused by his enemies.' Many of his followers fell round him, in defending their master. Ali's head was cut off and sent to Constantinople, where it was exhibited before the gate of the seraglio. His sons shared their father's fate. The Porte became possessed of Ali's treasures, which were very considerable, although absurdly exaggerated by Pouqueville. Thus Ali Pacha, at seventy-two years of age, closed his guilty, but extraordinary career, in February, 1822. A somewhat different account of the mode of his death is given in a book entitled *Sketches in Greece and Turkey*, &c. 1833.

The character of such a man is easily ascertained from the account of his life. It was also stained, like that of most Turkish grandees, by private vices of a disgusting nature. The cruelty of his revenge was truly fiendish. His administration rested upon the principles of terror; he certainly extirpated the robbers and other criminals, and rendered his territories perfectly secure from all depredations but his own. This security, in a country like Turkey, was felt as a boon, and commerce improved in some measure by it. Jannina became one of the most flourishing towns of Turkey, and its population had increased to 40,000 inhabitants. Ali was a Mussulman only by name: he fully protected the Greeks, and other Christians, in the exercise of their religion, and allowed them to have schools, and even a lyceum and a library. Ali treated all his subjects, Albanians, Turks, or Greeks, alike, and without partiality; the Turks were perhaps those who liked him the least, because he did not allow them to ill-use the rest of the people, as in other parts of Turkey.

Greek or Romaic was the language Ali generally spoke, and it was the language of his court; most of his agents and his secretaries were Greeks. His yearly revenue was calculated at about half a million sterling, but no account could be kept of the produce of his confiscations and the forced contributions which he imposed upon individuals.

For more particulars of this extraordinary man, the reader may consult the travels of Dr. Holland, Hobhouse, Hughes, and Colonel Leake. Malte-Brun has also given a good sketch of Ali's life, from which we have borrowed some of the above particulars.

A'LIAS is the term used in legal proceedings to denote a second or further description of a person who has gone by two or more different names. For example, if the same person is known by the name of John Smith as well as the name of John Thomson, he is described in civil and criminal pleadings, and in legal language generally, as John Smith, *alias dictus* (otherwise called) John Thomson. It has been considered in former times that as a person cannot have two Christian names, it would be improper in an indictment to describe the defendant as Elizabeth Newman *alias* Judith Hancock; but that a second surname may be laid under an *alias*, as a person may be known by several surnames. It is doubtful, however, whether at the present day, when a total alteration has taken place in the use of names, and the surname has become the real name of designation, such a distinction would be maintained.

A'LIBI is a term of frequent occurrence in criminal courts of justice. Thus, where a person charged with an offence committed at a certain time and place, shows that he was *elsewhere* at that time, he is said to prove an *alibi*. If true, this is obviously the best proof of innocence; but no kind of defence offers so ready an opportunity for false evidence: and the *setting up an alibi* is, therefore, always regarded in practice with suspicion.

ALICANTE, a modern province of Spain, formed of the southern portion of the kingdom of Valencia and a small part of Murcia.

ALICANTE, a well-built sea-port town in 38° 35′ N. lat. and 0° 24′ W. long., situated in a bay of the Mediterranean, in the kingdom of Valencia in Spain. The town is built on a peninsula, at the foot of a rocky mountain, which has a fortified castle at its summit 400 feet above the sea. Alicante has still a considerable trade, although it has much decreased of late years: this may partly be attributed to the political persecutions which its inhabitants have suffered since 1823, and which have caused a diminution in its population to the extent of nearly one-third. The declining state of its commerce may, however, be principally referred to the prohibitions placed on the importation of various articles of foreign manufacture and merchandize, and to the heavy duties imposed upon such other goods as are admitted. The greater part of its foreign trade consists in imports of linen from France and Genoa, tobacco from the United States of America, and cod-fish from Newfoundland; its exports are, barilla and almonds to England and Ireland, and wine to Brazil and the coast of Barbary. A considerable quantity of wine is also shipped to the port of Cette in Languedoc, whence it is sent by the great southern canal to Bordeaux, to be mixed with the inferior Medoc wines. Alicante likewise exports oil, olives, brandy, and soap: the quality of the last-mentioned article is much esteemed. The communications between the town and the contiguous country are for the most part kept up by means of small coasting vessels of from twenty to seventy tons burthen, the roads being so exceedingly bad, that such goods as are sent by land must be conveyed on the backs of mules and asses. The wheat required for the consumption of the inhabitants is mostly brought from places as far as two hundred miles inland, and for the reason just given, its cost is nearly doubled by the time of its arrival at Alicante. The average price of wheat during the ten years ending with 1831, was equal to 68*s*. 4*d*. per imperial quarter, while its average price in this kingdom during the same period was only 59*s*. 5*d*. Alicante is dependant upon foreign supply for the articles of cheese and butter, the prices of which are usually double what are paid in London; the consumption of these articles is therefore small, and the bulk of the population make use of oil instead. Meat is very indifferent in quality, and the price nearly as high as in England, so that taking quality into the account it is dearer than in England. The town is besides very ill supplied with water.

The number of vessels that entered the port from foreign parts was,

in 1829	.	128 ships,	19,706	tons
„ 1830	.	108 „	14,840	„
„ 1831	.	157 „	16,873	„

The Spanish vessels, including those employed in the coasting trade, that arrived in the same years, were as follows:

in 1829	. .	783 vessels	19,875	tons
„ 1830	. .	746 „	21,681	„
„ 1831	. .	813 „	22,645	„

Goods may be landed at Alicante, and lie in entrepôt for one year without payment of duty, and at any period during that time may be exported on paying 2 per cent. on their value. At the expiration of the year the duties must be paid, together with 2 per cent. *ad valorem* as an equivalent for warehouse rent.

The port of Alicante is an open bay, between the Cape de la Huerta and Plane Island, distant from each other about ten miles in a north-east direction. Ships on entering the port may steer between these points in any course direct for the castle, and come to anchor in four to eight fathoms water. The port has no pilot, nor indeed is one necessary. There is no perceptible tide in the port of Alicante; the depth of water varies from fifteen to four fathoms, according to the distance from the shore: neither bar nor shallows are to be passed in entering. Ships mostly lie in the bay at the distance of from a quarter of a mile to a mile from the shore. They are not exposed to any danger from winds, currents, or other casualties when at anchor, and during the last twenty years no case has occurred of a vessel being driven from her moorings.

A mole or quay is now in progress of construction, and has already been carried upwards of 300 yards and into fifteen feet water. It is intended to continue it into twenty-four feet water. This mole is constructed with large stones which are dropped into the sea: the western, or inner side, is faced with large blocks of cut stone. Small vessels lie alongside this quay in order to take in or discharge their lading.

Alicante stands on the site of the ancient town of Lucentum. During the peninsular war in 1812, when the French general, Suchet, succeeded in making himself master of the rest of the kingdom of Valencia, Alicante had the honour of successfully resisting the invaders. The population,

in 1810	amounted to	21,463	souls
„ 1820	„	20,348	„
„ 1830	„	14,230	„

ALICATA, a city on the south coast of Sicily, in 37° 4′ N. lat., and 13° 55′ E. long. It is used as a military position, and has been tolerably well fortified, but the walls have been suffered to go to decay, and are now lying in large fragments on the beach. Alicata is built on the right bank of the river Salso, which divides the provinces of Noto and Mazzara: it is very favourably situated for trade, and exports considerable quantities of grain and sulphur. The port is a '*caricatore*, or place endowed with immunity for exporting the produce of the country.' Notwithstanding these advantages, the general appearance of the place is that of neglect and poverty. The anchorage is about a mile south-west of the town, in from seven to twelve fathoms water, with a good clay bottom, but ships are much exposed in winter 'to all the winds from east to west round southerly.' This evil might be remedied at a moderate expense. Two reefs of rocks off the west end of the town could easily be converted into excellent moles, for which purpose the neighbourhood affords abundance of stone and lime, and the useless old horn-work of the castle might be excavated, so as to form a wet dock capable of containing in perfect security nearly a hundred sail of small craft.

'The suffrage of custom' has allotted to each of the principal cities of Sicily an agnomen, illustrative of their consideration, and Alicata is known among the inhabitants as *L'Amata*, or the beloved. Its population amounts to nearly 11,000. (Smyth's *Memoir of Sicily*.)

ALICUDI. The most westerly of the Æolian or Lipari islands, a group belonging to Sicily, and situated between the north coast of that island and the continent of Italy. Alicudi was called Ericusa and Ericodes, by the Greeks, from the heath which grows on it. (See Strabo, 276. Casaub.) Alicudi is a corrupted form of Ericodes, as Felicudi, another island of the group, is a corruption of Phœnicodes. It consists of an abrupt conical-shaped crater, about six miles in circumference, which rises at once from the sea. The surface is composed of irregular ravines and precipitous hills; and although its fires have been extinct for so many ages that no history notices its conflagrations, the lava is seen in grotesque forms like a stream extending from the summit to the sea, and retaining the apparent sterility and forbidding aspect of a recent eruption. The island is, nevertheless, cultivated with laborious industry in every spot capable of producing vegetation. Barilla, flax, capers, and pulse are produced, and wheat of a peculiarly fine quality.

The coasts are rude, craggy precipices, affording only two landing places, which are very difficult of access in fresh winds. The best is on the south-east side under Point Palomba; the other is on the north-east coast. The population of Alicudi amounts to about 260 persons, among whom diseases are said to be almost wholly unknown. They live so secluded from the rest of the world, that a visit from a stranger is an extraordinary event, and they owe to the peculiar formation of the island their security from the attacks of pirates, who so frequently infest the Mediterranean sea. (Smyth's *Memoir of Sicily*.)

ALIEN. An alien (*alienné*, *alibi-natus*, *alienigena*) is a person born out of the allegiance of the king. By such appellation he is distinguished from a native subject, who owes perpetual allegiance to the crown of these realms.

It is not true that every person, born out of the dominion of the crown, is *therefore* an alien; nor is a person born within them necessarily a natural-born subject. It is essential to alienage that the birth of the individual occurred in a situation and under circumstances which gave to the king of this country no claim or right to his allegiance.

It is not intended here to present any view of the subject as founded on the law of nature or of nations, or to detail the municipal regulations which foreign states have deemed it expedient to adopt in reference to their intercourse with strangers; but we shall confine ourselves to the existing state of the law of England, as it regards this class of persons.

The following instances will serve to illustrate the above description of an alien. The native subject of a foreign country continues to be an alien, though the country afterwards becomes a part of the British dominions. Thus, persons born in Scotland *before* the union of the crowns by the accession of James I., were aliens even *after* that event; but those who were born afterwards were adjudged to be natural-born subjects. This question was the subject of solemn discussion in the reign of that prince; and the reported judgment of the court has been a landmark to succeeding lawyers in all similar controversies. Persons born in those parts of France which formerly belonged to the crown of England, as Normandy, Guienne, Gascony, &c., were not considered as aliens so long as they continued so annexed; and, upon the same principle, persons born at this day in any of our colonial possessions are accounted native subjects. A man, born and settled at Calais whilst it was in the possession of the English, fled to Flanders with his wife, then pregnant; and there, after the capture of Calais by the French, had a son: the issue was held to be no alien. When an hostile army enters a foreign territory, the children of the invaders, born during such hostile occupation, are to be considered as native subjects of the invading country and not of the country invaded.

The children of ambassadors, and other official residents in foreign states, have always been held natives of the country which they represent and in whose service they are. This rule prevailed even at a time when the law of alienage was stricter than it now is. It has been since so far extended by various enactments, that all children born abroad, whose fathers or grandfathers on the *father's* side, were natural subjects, are now deemed to be themselves natural-born subjects, unless their fathers were liable to the penalties of treason or felony; or were in the service of a prince at war with this country. (25 Ed. III., st. 2; 7 Anne, c. 5; 4 Geo. II., c. 21; 13 Geo. III., c. 21.)

It follows from the general principles of our law, and, it is believed, of the law of most other European states, that a man may subject himself to a double and conflicting allegiance; for, though he may pledge his allegiance to the sovereign of his adopted country, he cannot divest himself of the duty which he owes to his own. So that, in the event of a war between the two states, he can take no active part on behalf of one without incurring the penalty of treason in the other. It appears, too, that this distressing predicament may occur without any default of the party; for the children of aliens are (except under peculiar circumstances) natural subjects of the state in which they were born: yet we have seen above that they may still be regarded as natural-born subjects of the state to which their parents owed allegiance.

Having described the persons whom the law designates as aliens, we shall shortly point out the legal consequences of alienage, and the means by which its attendant incapacities may be either wholly or partially removed. An alien cannot hold property in land without the king's permission; and if it should become vested in him by purchase, it is forfeited to the crown, after the fact of purchase has been regularly ascertained and declared by a jury. The occasional hardship of this rule is usually obviated in practice by a voluntary grant of the lands by the crown, after they have become vested in it by an inquisition under a *commission of escheat*. An alien cannot take land by act of law,—as by descent, dower, or curtesy; nor can he take under a devise. In these cases there is no forfeiture to the crown; for no estate or interest whatever vests in the alien which can be the subject of escheat. Whatever may be the policy of these disabilities at the present day, they seem to have had a reasonable origin in the maxims of the feudal law, which annexed to the tenure of land various services incompatible with foreign allegiance. An alien may, however, possess himself of goods, money in the funds, and other personal effects, to any extent; and as the law has, from a very early period, recognized his right to reside, without molestation, within the realm for commercial purposes, (see *Magna Charta*, art. 48,) he enjoys the incidental right to occupy a house and premises, provided he does not attempt to acquire any permanent interest in them. An alien may dispose of his property by will. The *droit d'aubaine*, or right of succeeding to the effects of a deceased alien, formerly claimed by the crown of France, never prevailed in this country. Nor was it customary to enforce it even in France, except as against the natives of a state in which a similar right was exercised. This doctrine of reciprocity was adopted by the *Code Napoléon*, (*Code Civil*, art. 726,) but has since been abrogated; so that aliens are now on the same footing, in this respect, with native Frenchmen throughout that kingdom. Aliens, who are parties to any proceeding, civil or criminal, in our courts of justice, are in most cases entitled to trial by a jury *de medietate*,—*i. e.*, a jury of which one-half is composed of foreigners.

The disabilities of aliens may be partially removed by the king's letters-patent, constituting the party a *free denizen*. From the date of the grant he is entitled to hold land, and transmit it to his *after-born* children, and to enjoy many other privileges of a native subject. But the most effectual method of naturalizing an alien is by Act of Parliament, called a *Naturalization Bill*, by which he is admitted to every right of a natural-born subject, except the capacity of sitting in Parliament or the Privy Council, or of holding grants and offices of trust under the crown; an exclusion dictated by the jealous policy of the legislature on the accession of the House of Orange.

It is to be observed, that the rights and incapacities attaching to aliens, enumerated above, must be understood to apply only to alien *friends*. Alien *enemies*, or subjects of a foreign state at war with this country, are in a very different condition, and may be said to possess very few civil rights of any kind which the law will recognise or protect.

As examples of the policy which has at different times been pursued in this country, with reference to the reception of aliens, the following historical notices may perhaps be interesting:—

Magna Charta stipulates, in the article already cited, for the free access of foreign merchants for the purposes of trade, and its provisions were enforced and extended under the reigns of succeeding princes.

In the eighteenth year of Edward I., the parliament rolls contain a petition from the citizens of London, ‘that foreign merchants should be expelled from the city, because they get rich to the impoverishment of the citizens;’ to which the king replies, that ‘they are beneficial and useful, and he has no intention to expel them.’

In the reign of Edward III., several beneficial privileges were conferred on aliens, in furtherance of foreign commerce.

Under Richard II., and his successor, statutes were made imposing various restraints on aliens trading within the realm, and especially prohibiting internal traffic with one another. Similar restrictions were introduced in the reign of Richard III., chiefly with a view to exclude them from retail trade; and in that of Henry VIII., violent insurrections against aliens were followed by repeated statutes, reciting the mischievous consequences attributed to the influx of foreigners, and laying severer impediments in the way of their settlement within the realm. Several acts of this description are still in force, though they have fallen into practical disuse; but it has been the uniform policy of the courts of law to put on them a construction the most favourable to foreign commerce, agreeably to the sentiments of Lord Chief Justice Hale, that ‘the law of England hath always been very gentle in the construction of the disability, and rather contracting than extending it severely.’ (Ventris's *Reports*, vol. i. p. 427.)

In the reign of James I., the king was strongly petitioned to adopt exclusive measures against the aliens, who had flocked into the kingdom from the Low Countries; but James, though he acquiesced to a certain extent in the object of the petitioners, seems by no means to have participated in their feelings of enmity to aliens; for he professes his intention ‘to keep a due temperament between the interests of the petitioners and the foreigners; and he especially commends ‘their industrious and sedulous courses, whereof he wished his own people would take example.’

In the reign of Charles II., aliens were invited to settle in this country, and to engage in certain trades, by an offer of the privileges of native subjects. (15 Car. II., c. 15.)

In the early part of the last century (1708) a bill was carried in parliament for the general naturalization of all foreign Protestants notwithstanding the strenuous opposition of the city of London: but, after remaining in operation for three years, it was repealed on a suggestion of its injurious effects upon the interests of natural-born subjects. The reasons for and against the measure will be found in the fourth volume of Chandler's *Commons' Debates*, p. 119-122.

Upon a review of the history of our policy, the inference seems to be, that although the maxims prevalent in our courts of law have been generally favourable to the rights of aliens; and although the executive authorities of the state appear to have been at all times sensible of the fiscal and other advantages resulting from a liberal reception of foreign settlers engaged in trade, yet popular prejudices have been, on the whole, successfully exerted in impressing upon the legislature a more jealous and exclusive system.

The temporary restraints upon aliens, introduced during the late wars, had their origin in objects altogether distinct from commerce or political economy. There is reason to believe that the power of banishing them from the realm has at all times existed in the crown: at all events it has undoubtedly been often exerted; and it seems almost to be included in the ampler prerogative of declaring war against the whole, or any part, of a foreign state. However, either from want of recent authentic precedents, or from a desire to accompany the measure with provisions not within the scope of the ordinary functions of the executive, this power has not been called into activity of late years without the previous sanction of parliament. After the expiration of the last of the alien acts, a measure was introduced for the general registration of all aliens visiting this country, which is still in force. (See 7 Geo. IV., c. 54.)

ALIMENT. [See FOOD.]

ALIMONY, from the Latin *alimonium* or *alimonia*, a barbarous word, signifying 'maintenance or support.' By the law of England, which in this respect corresponds with the civil law, a wife is presumed to have surrendered the whole of her property to her husband upon marriage, and consequently to be entirely dependent upon him for her future maintenance. Upon this principle, it is reasonable that if a separation takes place, the wife should have a portion of her husband's estate allotted to her for her subsistence; and this allotment, made by the ecclesiastical courts, is termed in law 'alimony.' The right of a wife to this provision depends, however, entirely upon the truth of the presumption, that she has not sufficient means, independently of her husband, to support her in her appropriate station in life; for in cases where she has a separate and sufficient income, not vested in the husband by the marriage, and therefore beyond his control, the wife is not entitled to alimony.

Alimony, in common with other subjects of matrimonial litigation, falls properly under the exclusive cognizance of the ecclesiastical courts; for though courts of equity have not unfrequently decreed a separate maintenance resembling alimony, yet their interference in such cases seems to have proceeded upon the ground of enforcing some express agreement between the parties, and is not founded upon the legal right of the wife to a portion of her husband's estate, resulting from the general principle above stated. In the ecclesiastical court, the allotment of alimony is necessarily incidental to a decree of divorce *a mensâ et thoro* upon the ground of cruelty or adultery on the part of the husband. It may be either temporary or permanent: in the first case, while the proceedings in the suit for a divorce are depending, the court will, generally speaking, allot alimony to the wife *pendente lite*, or during the continuance of the litigation; and in the second case, when a decree of divorce has been obtained on either of the above grounds, a permanent provision may be given to her; in both cases the allotment is made in the form of a stipend for her maintenance from year to year, and is proportionate to the estate of the husband.

The amount of alimony to be allotted depends wholly upon the discretion of the court, equitably exercised with a view to the circumstances of each particular case. In forming their estimate in this respect, the courts have held, that after a separation on account of the husband's misconduct, the wife is to be alimented as if she were living with him as his wife; they attend carefully to the nature, as well as to the amount of the husband's means, drawing a distinction between a substantial property and an income derived from personal exertion. The station in life of both parties, and the fortune brought by the wife, are also considered; and much stress is laid upon the disposal of the children and the expense of educating them. The conduct of the parties forms also a very material consideration: where the wife has eloped from her husband, or where the sentence of divorce proceeds upon the ground of her adultery, the law will not compel the allowance of alimony; for as adultery amounts to forfeiture of dower after the death of the husband, it is a sufficient reason why the wife should not partake of his estate while living. In assigning the amount of alimony, it should be observed, that in order to discourage vexatious litigation, as well as upon the just principle that innocence of imputed misconduct is to be presumed until the contrary is proved, alimony during the continuance of a suit is always much less in amount than permanent alimony. Thus in the former, the proportion usually allowed is one-fifth of the net income of the husband; in the latter, after a charge of cruelty or adultery has been established, a moiety of the whole income is frequently given. This seems to be the result of numerous cases in which the quantum of allotment has been decided; but no general rule can be laid down upon this subject, as the amount granted must always depend upon the discretion of the judge, exercised upon the infinitely varied combinations of facts brought before him.

The assignment of alimony during the continuance of a suit will not discharge the husband from liability for his *wife's contracts*; but when the court has allotted her a permanent maintenance upon the termination of a suit, the wife is liable for her own contracts, and the husband is wholly discharged from them. On this ground, and with a view to the protection of the husband, the ecclesiastical court has sometimes granted alimony in cases where the wife, by her own profligacy or extravagance, has thrown enormous expense on her husband, and has thereby forfeited her equitable title to a subsistence from his estate.

ALIQUOT PART. One number or fraction is said to be an aliquot part of a second number or fraction, when the first is contained an exact number of times in the second. Thus, 6, 3, 4, 2, 1½, ⅜, ⅛, &c., are all aliquot parts of 12, being contained in it respectively 2, 4, 3, 6, 8, 28, 96, &c. times. The word is principally used in the arithmetical rule called *practice*, and the convenience of using it is as follows. If we want to know how much 30½ yards cost at 1*l*. 15*s*. 6*d*. a yard, the direct process of common arithmetic would be to turn 30½ yards into half yards, giving 61, and 1*l*. 15*s*. 6*d*. into sixpences, giving 71. Then multiplying 61 by 71, and dividing the product by 2, we have the number of sixpences which 30½ yards cost, which must then be reduced into pounds, shillings, and pence. But if we observe that 1*l*. 15*s*. 6*d*. is made up of 1*l*., 10*s*. the half of one pound, 5*s*. the half of 10*s*., and 6*d*. the tenth of 5*s*., we can proceed as follows:—

	£.	s.	d.		£.	s.	d.
30½ yards at	1	0	0	per yard cost	30	10	0
,,	0	10	0	,,	15	5	0
,,	0	5	0	,,	7	12	6
,,	0	0	6	,,	0	15	3
,,	1	15	6	,,	54	2	9

in which each line is derived from the preceding by simple division, on the obvious principle that at 6*d*. a yard we give the tenth part of what we give at 5*s*. a yard, and so on.

The object therefore is, to be ready in dividing a sum of shillings and pence into parts, each of which shall be the aliquot part of a pound, or of one of the preceding parts. The following table contains the simple aliquot parts of a pound, arranged so that the aliquot part of an aliquot part shall be visible on inspection. Figures written by themselves are shillings, and the semicolons separate shillings from pence. The aliquot parts omitted contain fractions of farthings, and are useless.

		Half.	Third.	Fourth.	Fifth.	Sixth.	Eighth.	Tenth.	Twelfth.	Twentieth.	Fortieth.
	£1	10	6; 8	5	4	3; 4	2; 6	2	1; 8	1	;6
Half,	10	5	3; 4	2 ; 6	2	1; 8	1: 3	1	;10	;6	2
Third,	6; 8	3; 4		1 ; 8	1;4		;10	;8		;4	;2
Fourth,	5	2; 6	1; 8	1 ; 3	1	;10	;7½	;6	; 5	;3	;1½
Fifth,	4	2	1; 4	1		; 8	; 6		; 4		
Sixth,	3; 4	1 ; 8		; 10	;8		; 5	;4		;2	;1
Eighth,	2; 6	1 ; 3	; 10	; 7½	;6	; 5	; 3¾	;3	;2½	;1½	;¾
Tenth,	2	1	; 8	; 6		; 4	; 3		;2		
Twelfth,	1; 8	; 10		; 5	;4		; 2½	;2		;1	;½
Twentieth,	1	; 6	; 4	; 3		; 2	; 1½		;1		
Fortieth,	;6	; 3	; 2	; 1½		; 1	; ¾		; ½		

This table shows all the aliquot parts of a pound down to one halfpenny: for example, we see ;2½, signifying two pence halfpenny, opposite to *twelfth* under *eighth*, which shows us that 2½ is the twelfth part of the eighth part of a pound. If, therefore, we wished to find how much 3715 yards cost at 2½*d*. a yard, instead of multiplying by 2½, and dividing by 12 and 20, we should divide by 8 and 12, as follows:—

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 8 ) 3715
    ————————
12 ) 464  7  6
    ————————
    £38 13 11½
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[See PRACTICE.]

ALISMA'CEÆ, a natural order of plants belonging to the monocotyledonous division of flowering plants. It is known from all the other orders of the same division by its genera having the sepals and petals perfectly distinguishable from each other both in colour and situation, and by their carpella being extremely numerous. In many points they approach very nearly to the crowfoot tribe (Ranunculaceæ), from which the structure of their embryo and their endogenous mode of growth distinguish them. [See AGE OF TREES.]

All the species are aquatic plants, with rather broad, ribbed leaves and white flowers. They appear to be destitute of any active properties, except a slight degree of acridity, which, however, does not prevent the rhizoma of some of them from being eaten in China.

[Alisma Plantago—Great Water Plantain.]

The order receives its name from the genus Alisma, one species of which, *Alisma plantago*, a common wild plant, in wet ditches and by river sides, has had the reputation of being a cure for hydrophobia. Its powdered root is given in doses of from half a drachm to a drachm, either infused in wine or mixed with syrup.

A'LKALI. This word is compounded of the Arabic article *al* and *kali*, the name of the plant, by burning which a saline mass is obtained, containing the alkali in question; and in this term are comprehended various other bodies possessing similar properties.

The alkalis are numerous, and they are all compound substances; they do not result, however, from the action of any specific or alkalizing principle, being very variously constituted. All exist in nature, and some may be artificially formed. The alkalis may be divided into three classes:—

1st. *Ammonia*, existing in the animal fluids, and composed of two gaseous bodies, viz., hydrogen and azote; as it readily evaporates, it was formerly called the *volatile alkali*.

2d. *Compounds of certain metals and oxygen*, among which are potash and soda, which, though long known as the *fixed alkalis*, and usually obtained from the ashes of plants, were discovered by Davy to be metallic oxides: this class also comprehends the alkaline oxides or earths, lime, magnesia, &c. No metal yields two alkalis by different degrees of oxidizement; nor does any one become an alkali and an acid.

3d. The *vegeto-alkalis*, produced in plants during vegetation; they are, as far as has been ascertained, quaternary compounds of oxygen, hydrogen, carbon, and azote. This class includes *quina*, an active medicinal principle of cinchona or bark, and *morphia*, one of the narcotic principles of opium, &c.

Ammonia is the only alkali which has a strong smell, and is gaseous in its form, the rest being solid; it is caustic when applied to the skin, and acrid to the taste, and this is the case with the alkalis of the second class except magnesia. Ammonia dissolves readily in water, and so do the alkalis of the second class, except lime and magnesia. The vegeto-alkalis are very sparingly soluble in water.

Heat produces very different effects upon the different classes of alkalis: ammonia evaporates at low temperatures, and decomposes at high ones; the alkalis of the second class are all comparatively, and some perfectly fixed, even at high temperatures, and suffer no decomposition, though some of them acquire oxygen, if heated in the air. The alkalis of the third class are all decomposed at high temperatures, giving rise to new compounds.

The chemical and distinguishing properties of the alkalis are, that their aqueous solutions turn vegetable blues green, and vegetable yellows reddish-brown; and hence infusion of red cabbage and infusion of turmeric, or paper stained with them, are used as tests of the presence of an alkali. The alkalis restore the colour of vegetable blues which have been reddened by acids, and, on the other hand, the acids restore vegetable colours which have been altered by the alkalis.

The alkalis have great affinity for, and readily combine with acids, forming *salts*, and the power of both in altering vegetable colours is generally destroyed. The alkalis are separated at the negative pole of the voltaic trough. Ammonia and many of the alkalis of the second class combine with metallic oxides: thus the oxides of cobalt, copper, nickel, &c. are taken up by ammonia, while potash and soda unite not only with the oxides of lead, zinc, &c., but also with silica, alumina, &c. The nature of the compounds which they form with these substances, and others with which they unite, will be treated of under each particular alkali.

Ammonia is largely employed in medicine and in scientific chemistry; the alkalis of the second class are used for the same purposes, and also extensively in various chemical arts, as in soap and glass making, &c. Some of them act strongly upon vegetable and animal matter, producing changes which we shall notice under each alkali. The alkalis of the third class are principally employed in medicine.

The alkalis and alkaline earths which we shall more particularly notice are the following:—

Ammonia,
Atropia,
Barytes,
Brucia,
Cinchonia,
Delphia.
Digitalia,
Emeta,
Hyoscyama,
Lime,
Lithia,
Magnesia,
Morphia,
Picrotoxia,
Potash,
Quina,
Soda,
Solania,
Strontia,
Strychnia,
Veratria.

ALKANET. [See ANCHUSAS.]

ALKMAAR, is a strongly fortified and well-built town in North Holland, on the Helder canal, 20 English miles N.N.W. of Amsterdam: 52° 38′ N. lat. 4° 43′ E. long. It is intersected by broad canals, and has exceedingly pleasant environs of excellent gardens and rich meadows. This town is the greatest cheese depôt in Holland, and also a great butter market. It has some fabrics of sail-cloth; and a population of 9439 inhabitants on January 1, 1830. Alkmaar is a very old town, and from its position is of great importance to the defence of the province. In the expedition of 1799 the British and Russians, under the Duke of York, advanced as far as Alkmaar.

ALKMAAR (HENRY OF). This is the name assumed by the author of a celebrated old poem, in the Low-German, or Sassich dialect, entitled *Reineke de Vos*, (Reynard the Fox,) in the preface to the first edition of it printed at Lubeck in 1498. It can scarcely be said that any thing more is known of Alkmaar, except that a person of that name seems to have existed about the year 1470, and to have been tutor to one of the Dukes of Loraine. But it is extremely doubtful if this be more than an assumed name. Attempts have been made to show that the true author of *Reynard the Fox* was a person of the name of Nicholas Baumann, a native of East Friesland, who, having been a member of the council of Duke Magnus, of Juliers, and having been driven from the court of that prince by a cabal, wrote this poem to expose the arts of which he had been the victim, and, at the same time, assumed the name of Alkmaar to escape the revenge of those whom he satirised. But whoever was really the writer of the poem published at Lubeck in 1498, it has been clearly established that he was merely the versifier, and not the original author of *Reynard the Fox*. He states himself, indeed, in his preface, that he translated the work from the Welsh (though it may be difficult to say what language it is which he thus designates) and from the French. Two editions of a work in prose, and in the Dutch language, of less extent than the poem of *Reynard the Fox*, but containing the complete groundwork of its story, have been discovered; the one printed by Gerard Leew at Gouda, in 1479, the other (which is exactly similar, and of which there is a copy in the public library of Lubeck) printed at Delft, in 1485. A work of the same nature, and with the same title, appears to have been written in French about the beginning of the thirteenth century, by Pierre de St. Cloud, of which a metrical imitation was published at Lille towards the end of the same century, by Jaquemars Gélée, or Giellée, under the title of *Le Nouveau*

Renard. M. le Grand d'Aussy, in his *Notices et Extraits des Manuscrits de la Bibliothèque de Paris*, contends that these two productions are the true originals of the German poem. The general title of the fable, however, is probably much older than even the date there assigned to it; and it is said that traces of it are to be found in the minstrelsy of Germany long before the time of St. Cloud. *Reineke de Vos*, as already hinted, is a satirical poem, in which the different animals, being assembled at the court of their king, the lion, converse on the vices and follies of mankind. It has always been extremely popular in Germany, the edition which bears the name of Henry of Alkmaar having been repeatedly reprinted at Rostock, Francfort, and Hamburgh. The old poem has also been modernized in its language, and turned into hexameters by the celebrated Goethe. Versions of it have been likewise made into the Latin, Italian, Danish, Swedish, and English languages. Of these the most elegant is the translation into Latin verse, by Hartman Schopperus, under the title of *Speculum Vitæ Aulicæ; de Admirabili fallacia et Astutia Vulpeculæ Reinikes Libri Quatuor, nunc primum ex idiomate Germanico Latinitate donati*, &c., published in 12mo. at Francfort, in 1574, and again in 1584, with cuts, copious annotations, and a dedication to the Emperor Maximilian II. dated 1566. The English translation is one of the productions of Caxton's press, and is without any title page, but concludes as follows: 'I haue not added ne mynusshed, but haue folowed as nyghe as I can my copye, whiche was in Dutche, and by me, Willm Caxton, translated into this rude and symple Englysshe, in thabbey of Westmestre. Fynyshed the vi. daye of Juyn, the yere of Our Lord mcccclxxxi., and the xxi. yere of the regne of Kynge Edward the iiiith.' It may be added that this poem, besides its merit as a work of amusement, has been looked upon as very curious and valuable, for the illustrations which it supplies of ancient manners and customs. M. Dreyer, Syndic of Lubeck, has published a volume, under the title of *De l'Usage qu'on peut tirer de l'excellent poëme Rainier le Renard, pour l'étude des Antiquités du droit Germanique.* 4to, 1768. The latest edition of the poem, we believe, is that published in octavo at Brunswick, in 1825, with explanatory remarks, by Dr. K. Scheller, of which a notice may be found in the *Foreign Quarterly Review*, No. XV. (See the *Biographie Universelle.*)

ALL-HALLOWS, ALL-HALLOWMAS, or simply **HALLOWMAS**, the old English name for All Saints' Day, or the 1st of November. Thus, in Shakspeare's *Two Gentlemen of Verona*, Valentine's servant, Speed, enumerates, among the signs by which he has discovered that his master is in love, that he has learned 'to speak puling, like a beggar at Hallowmas;' and in the *Merry Wives of Windsor*, Simple, when asked by his master, Slender, for the *Book of Riddles*, replies, 'Why, did you not lend it to Alice Shortcake upon All-Hallowmas last, a fortnight afore Michaelmas?' All-Hallowmas was the Saxon term, as may be seen in the rubric prefixed to the fifth chapter of Matthew, in the Saxon version of the Scriptures. Boucher, in his learned and valuable *Glossary of Archaic and Provincial Words*, remarks, that while the other antient forms, Christmas, Michaelmas, &c., have been generally preserved, that of All-Hallowmas is now only used in the northern counties.

Mr. Strutt, in the third volume of his *Horda Angel Cynnan*, has printed an extract from an old manuscript in which it is asserted that this feast was 'by the pope ordained to fulfil our omissions for many a Saint's day in the year we have (leave?) unserved, for there been so many that we may not serve them all: for, as St. Jerome saith, in each day of the year been more than five thousand saints and martyrs, out-take the first day of January.' But Mr. Forster, in his *Perennial Calendar*, affirms that this notion is a mistake, and that 'the church in this great festival honours all the saints rising together in glory.' The institution of All-Hallowmas is said to have originated in the dedication of the Pantheon at Rome as a Christian temple, by Pope Boniface IV. in the seventh century, though it does not appear to have been observed as a holyday till two hundred years later.

All-Hallowmas derives its greatest importance from the popular usages, which in our own and various other countries have distinguished sometimes the day itself, but more generally the night preceding, called its eve or vigil. There is great reason to believe that this was a Pagan before it was transformed into a Christian festival; and there can, at any rate, be no question that the ceremonies to which we refer are exclusively of Druidical origin. All-Halloweven (the 31st of October) was marked, in the natural calendar of our climate, as one of the great epochs of the year. By that day the harvest was generally gathered in, and the work of the husbandman brought to a close. It was natural therefore that it should be celebrated in a manner expressive on the one hand of joy and thankfulness, and on the other of the occupations and amusements appropriate to the season of winter, of which it was the commencement. Bonfires accordingly appear to have been lighted; which custom still is, or lately was, preserved in many parts of Wales, Ireland, the Western Islands, and Scotland. See, in Sir John Sinclair's *Statistical Account of Scotland*, the accounts of the parishes of Callander, Logierait, Kirkmichael, Aberdeen, &c.; and in Hone's *Every Day Book*, vol. ii., p. 1259, a letter from a correspondent describing the fires which are kindled by the children on Halloweve in the midst of the White Cart River, on which the town of Paisley stands. In the latter work, vol. i., p. 1421, &c., and also in Brand's *Observations on Popular Antiquities*, there referred to, the reader will find many curious details respecting the antient popular observances on the eve of All-Hallows in Wales, the North of England, Ireland, and elsewhere. After the introduction of Christianity the ringing of bells seems to have been added to the lighting of bonfires. This noisy ceremony commenced on the vigil of the feast of All-Hallows, and was continued throughout all that day and the next. It was prohibited as superstitious both by Henry VIII. and by Elizabeth; but is said not to be yet altogether abolished. An old sermon, quoted by Boucher, describes the ringing as performed for the repose of all Christian souls.

Besides these out-of-door rejoicings, the eve of the festival was celebrated by much merry-making around the domestic hearth. It has been observed, that in the festivities usual on this occasion, the beverage of the assembled guests was always that called lamb's-wool, that is, ale or wine mixed with the pulp of roasted apples. General Vallancey has ingeniously explained this singular name of the drink used on Hallowmas-eve by deducing it from the old Celtic name of the day, La Mas Ubhal, that is, the day of the apple-fruit. The English term *lamb's-wool* is merely a corruption of this forgotten Celtic designation.

But the eve of All-Hallows is especially famous for those observances which have been wont to take place on it, connected with the superstitious wish of prying into futurity. The same ceremonies of this description appear to have been anciently practised in England, Ireland, and Scotland; but they are now almost universally disused, except in the last-mentioned country. Throughout Scotland, in her towns, as well as in her villages and merely agricultural districts, the old Druidical rites of Hallowe'en, as the 31st of October is there called, were, within these thirty years, almost as universally and as punctiliously observed, as they probably were in the darkest night of popery or heathenism. Nor is the custom, though perhaps now dying away, by any means even yet generally discontinued. In the country, at least, friends and neighbours still, as Burns has expressed it,

> 'Convene
> To burn their nits, an' pu' their stocks,
> An' haud their Halloween,
> Fu' blythe that night.'

The well-known poem from which these lines are quoted, and which is one of the most successful efforts of the inspired Scottish peasant, and among the greatest favourites of his countrymen, will immortalize the memory, if not the practice, of the ancient ceremonies to which it relates. As it is, in a country where all the other festivals of the church have been abolished and forgotten, the eve of All-Hallowmas still continues the most important day in the rural, perhaps we might say generally in the popular calendar. It owes this permanent distinction to the circumstance, which all its peculiar ceremonies announce, of being much older than the church. It derives its origin from the depths of heathen superstition. 'It is thought,' says Burns, 'to be a night when witches, devils, and other mischief-making beings, are all abroad on their baneful midnight errands; particularly those aërial people, the fairies, are said on that night to hold a grand anniversary.' All its observances accordingly imply an application to the agency of evil spirits. But for a particular account of the various modes in which this application is made, we must refer the reader to Burns's poem, and the notes by which it is illustrated.

ALL SAINTS. A cluster of three small islands so called from their having been discovered by the Spaniards on All Saints' Day. They are near the south side of the Island of Guadaloupe, and within its jurisdiction, in 15° 51′ N. lat., and 61° 44′ W. long.

The two largest islands of this cluster are called Terre-en-Haut, or High Island, and Terre-en-Bas, or Low Island. The first of these has a small village on its western side, between which and the third island, which is little more than a barren rock to the north-west, there is exceedingly good and safe anchorage in from six to sixteen fathoms water. On the south-west side of Terre-en-Haut is a mountain 813 feet above the level of the sea, and on the north coast is a remarkable promontory which serves as a landmark for vessels approaching from the northward. This island produces Indian corn for the subsistence of the inhabitants, and a little cotton for exportation. Terre-en-Bas also produces Indian corn and cotton, together with a small quantity of coffee, said to be of the finest quality.

The inhabitants of these islands, who are not more than 300 in number, are very poor, and subsist principally on vegetables and fish, which last are good and abundant. (Purdy's *Colombian Navigator*, and Alcedo's *Dictionary*.)

ALL SAINTS' BAY. A large and commodious bay in the province of the same name in Brazil. The entrance to the bay is in 12° 42′ S. lat., and 38° 42′ W. long.; it is eight miles wide between the points of Tagapipe and Saint Antonio. The province is bounded on the north by the River Real; on the south by the province of Los Ilheos; on the east by the south Atlantic ocean, and on the west by territory still in the possession of aboriginal Indians.

This bay is thirty-seven miles long from north to south, and twenty-seven miles wide in the widest part from east to west, within which space it is computed that secure anchorage could be found for all the navies of the world. The dimensions just given are, however, perhaps a little in excess. The bay contains several fertile islands; the largest of these, called Itaparica, stretches inwards from the mouth of the bay, to which it forms two entrances. This island is eighteen miles long, and about three broad in the widest parts: the coasts of the bay have many small inlets. Two shoals lie near the entrance on the west side, but are not dangerous, as there is a channel of sufficient breadth and depth for ships of any size.

All Saints' Bay, called by the Portuguese *Bahia de Todos Santos*, was discovered by the Portuguese navigators early in the sixteenth century, and an attempt to colonize the surrounding country was made under the auspices of King John III. of Portugal, by several persons of distinction, commanded by Francisco Pereira Cotinho. While their settlement was in its infancy, these adventurers were attacked by a tribe of native Indians and compelled to retire; after this they had the misfortune to be shipwrecked upon an island within the bay, when such as escaped the waves were massacred by the inhabitants.

A second settlement was afterwards made by the Crown of Portugal, and declared to be the capital of Brazil. This settlement appears to have prospered, and to have been the source of much profit to the government of the parent state, which drew from it annual supplies of gold, diamonds, topazes, sugar, and tobacco, with some other articles of minor importance.

This settlement having devolved upon the Crown of Spain, through the inheritance of Philip II., was attacked and captured by the Dutch in 1623, but was retaken in the following year by Don Frederique de Toledo.

The province is at present well cultivated, and produces an abundance of coffee, sugar, cotton, and tobacco, with a variety of medicinal roots, gums, balsams, and dyeing woods: large quantities of lignum-vitæ and mahogany are likewise collected. The labour of the plantations is performed by negro slaves.

The town of San Salvador, commonly known as Bahia, stands just within the bay on the east side. It has a considerable export trade to Europe in the articles just mentioned, and in return imports European goods. It trades likewise with Maldonado and Montevideo, whence it brings back salt beef for the consumption of the negroes, and hides; and with the Coast of Africa, where its tobacco is exchanged for slaves.

Several rivers which flow from the mountains discharge themselves into All Saints' Bay. The principal of these rivers are the Paraguaca, the Sergippe, the Jaguarippe, the Matuim, the Paranamerin, and the Pirajá. These streams add greatly to the trade of the port; nearly 1000 boats being constantly employed upon them in bringing down the various productions of the interior.

Nitre of excellent quality and in great abundance has been found in the south-west part of the province. The Town of Caxoeira, situated fourteen leagues from Bahia on the Rio Francisco, is the spot where the produce of the gold mines of the north is collected. Iron and copper are likewise found in the province. A piece of native copper weighing 2666 pounds, the largest perhaps known to exist in the world, was sent hence to Portugal, and is deposited in the Royal Museum of Lisbon.

The Coast of Brazil in the vicinity of this bay abounds with whales, but the fishing is prosecuted only by a few large boats, and the quantity of oil procured is seldom found equal to the consumption of the inhabitants. (Southey's *History of Brazil*, and Thompson's *Alcedo*.)

ALL SAINTS' BAY, a deep inlet on the Coast of California, in 31° 43′ N. lat., and 63° 34′ W. long., at the point where the Peninsula joins the province of New California. A cluster of detached rocks lies at the distance of three leagues off Point Grajero, the south point of the bay. The Mission of Saint Thomas, established in 1790, is in the immediate neighbourhood of this bay. (Vancouver's *Voyage*.)

ALL SOULS' COLLEGE, Oxford, was founded in 1437, by Henry Chichele, Archbishop of Canterbury; although in the charter of endowment which was obtained for it in the next year, King Henry VI. assumed the title of founder, a term which in the language of the day meant simply patron. The lineal descendants of those who had founded religious houses, and who retained the patronage, in the official returns at the dissolution, were all called founders. According to the charter, the society was to consist of a warden and twenty fellows, with power in the warden to increase their number to forty; and was to be called 'The College of the Souls of all the Faithful Deceased,' *Collegium omnium Animarum fidelium defunctorum de Oxon.* The obligation imposed on the society was to pray for the good estate of Henry VI. and the archbishop during their lives, and for their souls after their decease; also for the souls of Henry V. and the Duke of Clarence, together with those of all the dukes, earls, barons, knights, and esquires, and other subjects of the crown of England who had fallen in the war with France, and for the souls of all the faithful deceased. Sixteen of the fellows were to study the civil and canon laws, the rest philosophy and the arts, and theology. The most remarkable clause in the charter gave the society leave to purchase lands to the yearly value of 300*l.*, a sum of great magnitude for the time, and which has since been increased to 1050*l.* yearly value. Another charter of very extensive privileges was granted soon after the foundation by King Henry VI., and this and the first charter were confirmed by Act of Parliament in the 14th Henry VII., 1499.

The statutes for the regulation of the college were not given till a few days before Archbishop Chichele's death. They were modelled after the statutes which had been given to New College, by William de Wykeham; and ordained that the fellows shall be born in lawful wedlock in the province of Canterbury, with a preference to the next of kin descended from Robert and William Chichele, the founder's brothers. A very ancient copy of the statutes is preserved among the Arundel manuscripts, now in the British Museum, No. 147. In the *Stemmata Chicheleana*, published in 1765, the founder's collateral descendants are traced through nearly 1200 families. To the society were also added chaplains, clerks, and choristers.

The founder gave this institution the manors of Wedon and Weston, or Wedon Pinkney in Northamptonshire, Horsham and Scotney, or Bletchcourt in Kent, the rectory of Upchurch in Kent, and the suppressed Alien Priories of New Rumney in Kent, Alberbury, or Abberbury in Shropshire, St. Clare in Carmarthenshire, and Llangenith in Glamorganshire. The Alien Priory estates are said to have been resumed by King Edward IV., but were afterwards restored. Besides these possessions, the trustees of the founder purchased the manors of Edgeware, Kingsbury, and Malorees in Middlesex; and the founder himself bequeathed the sums of 134*l.* 6*s.* 8*d.*, and 1000 marks, to be banked for the use of the college.

In 1442, the college was capable of receiving the warden and fellows: but it was not finished till the latter end of 1444. The expense of the buildings were estimated at 4156*l.* 5*s.* 3¼*d.*; the purchase of grounds, books, chapel furniture, &c., at 4302*l.* 3*s.* 8*d.* The accounts of the minor items are still remaining.

Among the benefactors to this society of an early date we find the names of James Goldwell, Bishop of Norwich, Cardinal Pole, and David Pole, Bishop of Peterborough: but the acquisitions from these and other persons consisted chiefly in advowsons. The endowment of the college was valued, in 1535, at 392*l.* 2*s.* 3*d.* per annum; in 1592, 500*l.*; and in 1612, the society consisted of ninety-three persons. At present, 1833, it consists of a warden, forty fellows, two chaplains, and seven clerks; the total number, including members not on the foundation, is one hundred and one. At the election of a warden, the society present two of their number to the Archbishop of Canterbury, the visitor, who makes choice of one.

Of the original buildings, as left by the founder, very little now remains. The principal front, towards the High-street, till within a few years retained somewhat more of its ancient character than at present. This front was, at first, 194 feet in length, opening into two quadrangles. It has been recently in part renewed, and its appearance altogether improved. The gate to the westward has figures of Henry VI. and Archbishop Chichele. The great quadrangle was erected by Hawksmoor soon after the beginning of the last century. The chapel, hall, and library, which have passed through three stages of alteration since the foundation of the college, agree in the general outline of character with the newer buildings. The greater part of the new buildings were constructed at the expense of various benefactors. The hall at the east end of the chapel was renewed in its interior, in 1729; it contains, beside numerous busts and pictures, Bacon's statue of Sir William Blackstone. The new library, which superseded the old one in the original quadrangle, now reduced to chambers, was built from funds supplied by the liberality of Colonel Christopher Codrington, who had been first a fellow of the college, and afterwards governor-in-chief of the Leeward Caribbee Islands. It was begun in 1716, but not finished till 1756, at an expense of 12,101*l.* 5*s.*, leaving a surplus of donation, with which an estate, the rents of which are appropriated to the purchase of books, was bought at Lewknor, in Oxfordshire. This noble room is 190 feet in length by 32½ in breadth, except in the central recess where the breadth extends to 51¼ feet; the height is 40 feet, with a gallery surrounding three sides. The collection of books which it contains is one of the finest in Oxford, and is continually increasing. The chapel preserves the exterior only of its ancient state; it underwent much disfigurement in the interior at and after the Reformation, from the circumstance of the founder having directed that on certain occasions it should be appropriated to public use. The last alteration of the interior of this chapel took place about the beginning of the last century, and was accomplished by the combined taste and skill of Dr. Clarke, Sir James Thornhill, and Sir Christopher Wren. Mengs's fine picture of the *Noli me tangere* was afterwards purchased as an altar-piece for it, at the price of 300 guineas.

Among the more eminent members of this college may be enumerated the celebrated Linacre, Leland, the antiquary, Sir Anthony Shirley, Brian Duppa, bishop of Winchester, Archbishop Sheldon, Jeremy Taylor, Tindal, Dr. Sydenham, Sir Christopher Wren, Young, the author of the *Night Thoughts*, Sir William Blackstone, and Reginald Heber the late bishop of Calcutta. (Wood's *Colleges and Halls of Oxford*, by Gutch; Chalmer's *Hist. of the Colleges; Univ. Calendar*.)

ALLA, as used in Music, an Italian preposition, or the dative of the feminine article *la*, which, prefixed to certain words, signifies, or has the power of the phrase, *in the manner of*: e. g. *Alla Capella*, in the manner of chapel, or church, music:—*All'Antica*, in the ancient manner:—*Alla Francese*, in the French style:—*All' Inglese*, in the English style; &c.

ALLA-BREVE, in Music, an Italian term, signifying a quick time, in which the notes take only half their usual length. This is synonymous with *Tempo di Capella*, or time of church music, in which each bar, according to the practice of the old composers, contains one breve, or two *semi-breves*, or their equivalents. *Alla-Breve* time is very rarely used in modern music. The fine fugue in the Messiah, 'And with his stripes we are healed,' is an ex ample of this measure.

ALLAH is the Arabic name of the Supreme Being, which through the Koran has found its way into the languages of all nations who have embraced the Mohammedan religion. It is properly a contraction of *al-ilâh*: *al* is the Arabic definite article, and *ilâh*, which corresponds to the Hebrew words *Eloah* and *Elohim*, signifies a deity generally: the prefixed article restricts the meaning, and *al-ilâh* or *Allah* signifies the True God, as opposed to the deities worshipped by idolaters. The word *Allah* is frequently met with as a component part of Arabic proper names: e.g. *Abd-allah*, i. e. the Servant of God. *Allah akbar* (God is great) is the common battle-cry of the Mohammedans. The phrase *Bism Allah* or *Bism-illah* (in the Name of God) is invariably uttered by devout Mussulmans before the commencement of any undertaking, and before their meals: it is also put at the beginning of their books.

ALLAHABAD, a considerable province of Hindostan, lying between the 24th and 26th parallels of north latitude. It is bounded on the north by Oude and Agra; on the east by Bahar; on the south by Gundwana; and on the west by Malwa.

This province is divided into eight districts: viz., Allahabad, which contains the town and fortress of the same name; Benares, Mirzapoor, Jounpoor, Rewah, Bundelcund, Cawnpoor, and Manicpoor. The length of the province from east to west is 270 miles, and its average breadth from north to south, about 120 miles.

According to Abul Fazl, this territory was invaded in the year 1020, by the Sultan Mahmood of Ghizni, who then met with only partial success, and returned again to the attack three years thereafter, but without effecting a permanent conquest. The province fell afterwards under the dominion of the Emperor of Delhi, and in the fifteenth century it became an independent kingdom, of which Jounpoor was the capital. Partaking the lot of other Patan districts, it subsequently came into possession of the Mogul emperors, and was formed into a distinct soubah* by the Emperor Akbar, who, at the same time, gave to the district the name which it now bears.

At the breaking up of the Mogul empire, the northern part of the province was seized by the Nabob of Oude. In 1775, the East India Company acquired the Benares district under a treaty with the Soubahdar of Oude, and in 1810, the Company obtained from the same government the further cession of the city of Allahabad and the adjacent districts. In 1803, the south-eastern districts of the province were received by the British in exchange for territories in Guzerat and the Carnatic.

Allahabad is one of the most populous and productive provinces in the Indian empire. It furnishes diamonds, indigo, cotton, sugar, opium, and saltpetre, besides which the natives carry on very considerable manufactures of cotton cloth. The greatest proportion of the population are Hindoos, only about one-eighth part professing the religion of Mohammed.

The principal rivers of the province are the Ganges, the Jumna, the Goomty, so called from its winding course, and the Caramnassa, with their branches. Major Rennell supposes that the last-named of these rivers is the Commenases of Arrian (*Indica*, chap. 4). The streams are all in the northern part of the province; the country in their vicinity is generally flat and fertile, but the climate is extremely sultry and exposed to the visitation of hot winds. To the south-west the country is hilly. In this quarter, in the district of Bundelcund, the diamond mines of Pannah are situated. These are less profitable now than formerly; only a few stones of superior quality having been found during many years. (Rennell's *Memoir of a Map of Hindostan*; Hamilton's *East India Gazetteer*.)

ALLAHABAD, a judicial subdivision of the province of the same name already described. The territory of which this district is composed is for the most part immediately surrounding the city of Allahabad; some other portions are, however, nearly one hundred miles distant from the capital. The soil, which in general consists of a sandy loam, is very fertile, so that the crop of wheat, which is the grain principally sown, is said to amount on the average to fifty-six bushels to the English acre. To obtain this return, artificial irrigation is resorted to, and this forms the most laborious part of the cultivator's task. Barley, peas, and potatoes are likewise produced, but the most important cultivation of the district consists of indigo, cotton, and opium, which are largely exported. The last-mentioned of these articles was introduced into the district about eight years ago, after considerable opposition on the part of the ryots, who are averse to any kind of innovation. The district contains 16,55,106 begahs (about 550,000 acres) of land in cultivation, the annual revenue from which amounts to 27,93,244 rupees; 11,09,777 begahs of land are waste, and of these about one-third are said to be fit for cultivation.

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* According to the institutes of Akbar, a soubah should consist of twenty-two circars, a circar of twenty-two pergunnahs, a pergunnah of twenty-two tuppahs; and a tuppah of twenty-two villages; but this strictness of division has probably never been carried into effect.

The trade of this district was formerly in great part made up of cotton cloths, which were manufactured in considerable quantities in all the villages, but the course of this traffic has been altered of late years, in consequence of the cheapness of English goods of that description, and this branch of native industry has much declined in consequence. The district enjoys a considerable transit trade, for which it is well fitted by its geographical position between the coast of Bengal and the province of Oude, and the Gorkha territory. The exportable produce of these districts is conveyed down the Ganges for shipment—salt, metals, woollen cloths, and drugs being the principal articles conveyed from the coast in return. (Hamilton's *East India Gazetteer;* Tennant's *Indian Recreations; Parliamentary Papers.*)

ALLAHABAD, the capital of the district and province of the same name in Hindostan, is situated in 25° 27′ N. lat., 81° 50′ E. long., at the junction of the rivers Ganges and Jumna. An extensive fortification is erected on the tongue of land where these streams unite, so as completely to command the navigation. This fort is built of polished freestone with circular bastions at intervals, in which the cannon are mounted on the sides next to the rivers; the land side is a perfectly regular fortification, of strength sufficient to resist all attacks of a native army, and to require a regular siege by European troops. The East India Company has expended considerable sums for improving these fortifications.

The city of Allahabad is supposed to occupy the site of the ancient Palimbothra (Arrian. *Indica*, 10); but this is not certain. A great part of its present buildings are of mud, and are erected on the ancient foundations of substantial brick edifices, while much of the soil in the immediate neighbourhood, consisting of materials used in building and of the fragments of earthenware vessels, attests the former magnitude of the city.

This place is considered by Brahmins to be the most holy of all the sacred confluences of rivers in Hindostan: it is called by them *Bhat Prayag*. It owes this pre-eminence to the belief that it is the point of junction of three rivers, the Ganges, the Jumna, and the Sereswati. It is true that the last-mentioned of these rivers is no where visible in the neighbourhood, but this difficulty is surmounted by the assertion that the missing stream joins the other two underground, and pilgrims who bathe here are held to acquire the same merit as if they were to immerse themselves in all three rivers separately. On arriving at this sacred spot, the pilgrim seats himself on the brink of the river, and has his head shaved so that each hair may fall into the water, the sacred writings of the Hindoos promising a residence in paradise of one million of years for each hair so deposited. After this operation, the devotee must bathe, and the next day must perform the obsequies of his deceased ancestors. Many pilgrims are so impressed with the sanctity of the place, and of the purity which it imparts, that conveying themselves in a boat to the exact spot where the three rivers are supposed to unite, they plunge into the stream with three pots of water tied to the body, so that they must inevitably sink to the bottom. The East India Company levies a tax of three rupees on each pilgrim who visits this sanctified spot; the number of these visiters varies exceedingly in different years; but more than 200,000 have been known to pay the tax in one year.

Allahabad was a favourite residence of the Emperor Akbar, who may be said to have been the founder of the modern city, and of its fortifications. Its situation must in those days have given it a great degree of political importance. In 1765, the fort was taken by Sir Robert Fletcher, but was afterwards restored to the Nabob of Oude, and again was transferred to the Company in 1803. The city now contains a permanent judicial establishment, whence periodical circuits are made through the province. It likewise contains a school set on foot in 1825, by the subscriptions of some English gentlemen, which has since flourished, having received assistance from the government. In 1830, this school contained sixty-four native students who were studying the Persian and Hindoostanee languages, and had made tolerable proficiency in geography and arithmetic, besides acquiring a practical knowledge of surveying. Five of these students have since obtained employment as surveyors under the Company's government. The present population of Allahabad, exclusive of the garrison, is estimated at 20,000 persons.

Allahabad is 820 miles from the sea following the course of the Ganges, but the travelling distance between the city and Calcutta is only 550 miles in a north-west direction. The distance from Benares is 53, from Lucknow 127, from Delhi 212, and from Agra 296 miles. (Major Rennell's *Memoir of a Map of Hindostan;* Bernier's *Travels;* Mill's *History of British India; Parliamentary Reports.*)

ALLAN, DAVID, was born in Edinburgh, and began the study of the arts in an academy founded at Glasgow. He afterwards went to Italy, and in 1773 obtained the prize of the academy of St. Luke, given for the best specimen of historical composition. He returned to England in 1777, and resided some time in London. He practised history, portrait, and landscape. His pictures of the latter class resembled those of Gaspar Poussin. About the year 1780 he went to Edinburgh, and was appointed director of the academy established in that city by the trustees for the manufactures and improvements, and for the diffusion of the principles of the fine arts, in Scotland. His talents were chiefly exercised on works of humour, of which he has left many specimens both in painting and etching. Several of his works have been engraved, and four, representing the sports of the carnival at Rome, were aquatinted by Paul Sandby. Mr. Allan died April 6, 1796.

ALLATIUS (LEO), an eminent literary man of the seventeenth century. He was a Greek, born in the island of Chios, in 1586. Being carried over to Italy at an early age, he was taken under the protection of a powerful family in Calabria, and educated in the Greek college at Rome. Early in life he revisited his native country; but he soon returned to Rome, where, after a succession of literary employments, he was appointed librarian to the Vatican. For this post he was well fitted, by great industry and a retentive memory; and, in a long life, he edited manuscripts, translated Greek authors, and published many original works, which display more learning and power of collecting materials than taste or judgment. A Greek by birth, he was one of the most strenuous and bigoted upholders of the Roman Church and of papal infallibility, and hesitated not to invoke fire and sword as the legitimate means of converting obstinate heretics. (See his treatise *De Ecclesiæ Occidentalis et Orientalis perpetua Consensione.*) He is accused of having softened down the points of difference between the Greek and Latin Churches, in order to gratify Pope Urban VIII., who was bent upon effecting a reconciliation and union between them. He founded a college in the isle of Chios, and died at Rome in the year 1669, aged eighty-three.

ALLEGHANY, a river of North America, one of the tributaries, and generally considered the principal source, of the Ohio; the united waters of the Alleghany and Monongahela, at their confluence at Pittsburgh on the western limits of Pennsylvania, receive the name of Ohio. It rises within 5 miles of Lake Erie, and, fed by numerous branches, pursues a general course south by west for 200 miles to Pittsburgh. Its sources are the extreme north-eastern tributaries of the Mississippi basin, and flow from the highest part of the Ohio valley. (See Darby's *Geography of the United States.*)

ALLEGHANY MOUNTAINS, a subordinate chain of the great system of the Appalachian Mountains, which run through the United States of North America in a north-east and south-west direction. [See APPALACHIAN.]

ALLEGIANCE, or **LIGEANCE**, is the lawful obedience which a subject is bound to render to his sovereign.

The bond of allegiance (*ligamen*) is mutual and reciprocal; by it the subject is bound to obey, and the sovereign to protect.

The allegiance of a subject, according to the law of England, is permanent and universal; *i. e.*, he can, by no act of his own, abjure or repudiate the duties which it involves; nor can he by emigration, or any voluntary change of residence, escape its legal consequences.

Even an alien owes a local and temporary allegiance so long as he continues within the dominions of the king; and he may, therefore, be prosecuted and punished for treason.

An usurper, in the undisturbed possession of the crown, is entitled to allegiance; and, accordingly, our history furnishes an instance in which a treason committed against the person of Henry VI. was punished in the reign of his successor, even after an act of parliament had declared the former an usurper.

An oath of allegiance has, from the earliest period, been exacted from natural subjects of these realms; but its form has undergone some variations. In its ancient form, the party promised 'to be true and faithful to the king and his heirs, and truth and faith to bear of life and limb and terrene honour, and not to know or hear of any ill or damage intended him without defending him therefrom.' The modern oath, enforced by statute since the revolution, is of a more simple form, and is expressed in more indefinite terms. 'I do sincerely promise and swear that I will be faithful and bear true allegiance to his majesty King William.'

It is not to be supposed that the alteration of the form has, in any degree, varied the nature of the subject's duty, which is, indeed, owing from him antecedently to any oath, and although he may never, in fact, have been called upon to take it. The oath is imposed by way of additional security for the due performance of services inherently due from the subject from his birth, who is, in like manner, entitled to the protection of the king before the latter has formally accepted the duties of sovereignty by taking the coronation oath.

By the ancient law of the land, every male subject of the age of twelve years (with certain exceptions) was bound to take the oath of allegiance when summoned to the inferior criminal courts, called Leets and Tourns; and a variety of statutes, from the reign of Elizabeth down to the present century, have expressly required it from public functionaries and other persons before they enter upon their respective duties, or practise in their several professions. By 1 George I. c. 13., two justices of the peace, or other commissioners appointed by the king, may tender the oath to any person suspected of disaffection.

From a violation of allegiance results the highest offence known to the law of this country, viz., Treason.

Those who wish to become more fully acquainted with this subject, and to obtain an insight into the distinctions between *liege fealty*, or allegiance, and *simple fealty*, or fealty by reason of tenure, may advantageously consult Hale's *Pleas of the Crown*, vol. i. p. 58, *et seq.*, and Mr. Justice Foster's *Discourse on High Treason.*

ALLEGORY, literally, a discourse which has another meaning than what is directly expressed. Thus, the address of Menenius Agrippa to his fellow-citizens of Rome, as recorded by Livy, in which he described a rebellion of the industrious against the wealthier orders of a state, under the figure of a conspiracy of all the other members of the human body against the stomach, was an allegory. An allegory, however, is not intended to deceive or perplex, in which respect it differs from an enigma or riddle.

Allegory has been a favourite mode of composition in all countries and ages. Sometimes it has been recommended by seeming to afford the only or the fittest available means of giving a lively or intelligible representation of certain subjects or notions. The poets of different nations, for example, have resorted to this method, in order to convey sufficiently vivid conceptions of the different virtues and vices, and other abstractions which they have wished to set before their readers. They have personified these notions, as it is termed; that is to say, they have figured them in the shape of living beings invested with the forms and qualities naturally adapted to the character of each. Such pictures are allegories, and are to be found abundantly scattered over nearly all poetry. Some have even conceived that the whole mythology of pagan antiquity is merely a cluster of allegories; but this hypothesis is not favoured either by what we know generally of the birth and growth of superstition in the human mind, or by the earliest and simplest form in which these mystic fables have come down to us. Some of the critics of the Alexandrine school attempted to explain Homer allegorically. A slight examination of what remains of their miserable and feeble efforts will easily console us for the loss of their labours. The reader who is curious may see a specimen of this allegorical interpretation in Villoison's *Scholia*, (*Iliad*, v. 336.)

Of all poets who have dealt in allegories of this description, our own Spenser is the most famous and the greatest; no other has either produced so vast a number of these vivified idealities, or put into them such a spirit of life and air of actual existence. A long allegory, it is commonly said, has been usually unsuccessful as such; and, in illustration of this assertion, the instance of the *Fairy Queen* has been often quoted, as that of a work which, with all its attractions in parts, is wearisome as a whole. The plan of the general allegory upon which Spenser's poem is framed, is certainly in a remarkable degree complicated, cumbersome, and uninteresting; and if he had aimed at composing a mere tale of romance, without fettering himself with any scheme of allusion either to the moral virtues or the achievements of Queen Elizabeth, both of which subjects he has endeavoured to illustrate, he would have doubtless done better, as well as saved himself much needless labour. But, on the other hand, nobody complains of fatigue in reading Swift's *Tale of a Tub*, which is likewise a tolerably long allegory. This, and other examples which might be quoted, seem to prove that, if the allegory be sufficiently simple and natural, it may be protracted, without becoming tiresome, to a considerable extent.

ALLEGRET'TO, in Music, an Italian diminutive of *Allegro* (see Allegro), neither so fast nor so brilliant in manner as the term allegro denotes, though rather quick, and moderately gay.

ALLEGRI (C. ANTONIO). [See Correggio.]

ALLE'GRO, in Music, an Italian adjective, signifying *gay, sportive*, and, by inference, quick in time.

Allegro is the fourth in order of the five classes into which musical movement is divided; *e. g.*

Adagio,
Largo,
Andante,
Allegro,
Presto.

See Adagio.

An *Allegro* is not understood to be so fast in vocal as in instrumental music. Its quickness is likewise modified by the number and value of the notes in a bar. Thus it is always more rapid, *cæteris paribus*, in two-crotchet time than in four-crotchet—in three-quaver time than in six-quaver; and as the speed of this movement has many degrees of difference, other words are commonly added, more exactly to explain the composer's intention. This term is often found in the imperfect, the frequently barbarous, language of music, united to words utterly incompatible with it: for instance, the contradictory, and indeed ungrammatical, compound, *allegro agitato*, is not unusual. But one of the greatest musical geniuses of our day, or that ever lived, Beethoven, has, in his contempt for the real meaning of language, set common sense at open defiance: in his ninety-fifth opera, he directs the performance of a movement in the following words;—'Allegro assai vivace, *ma serioso*.' —*Very gay and lively, but seriously.*

The word *allegro* is also used substantively; thus we say an *Allegro* of Mozart, of Beethoven, &c. Some of its compounds are—

Allegro Agita'to, in a hurried manner.

Allegro Assai, very quick.

Allegro Brillan'te, quick and brilliantly.

Allegro Giusto, quick, but *just, precise*, and not so fast as allegro unqualified.

Allegro Modera'to, moderately quick.

Allegro di Molto (*di molto*, much), very quick.

Allegro Viva'ce (*vivace*, lively, brisk)—one of the tautologies of musical language—the same as *allegro brillante.*

Più Allegro, quicker, *more* quick.

Poco Allegro, rather (*a little*) quick.

ALLELUIA. [See Halleluiah.]

ALLEMANDE, in Music, a dance supposed to have derived its name from the country, Germany, in which, according to the prevailing opinion, it originated. It is written in two-crotchet time, and is now understood to be moderately quick, the word *Allegretto* best indicating its movement. But anciently this was a slow dance, according to Morley, Brossard, and Rousseau. Handel, and other composers of his period, write it in four-crotchet time, and we have always been of opinion that they never intended *their* allemandes to be so fast as they are performed by modern players.

ALLEN, or ALIN, or ALYN, a river which rises in Denbighshire, and flows through Flintshire in North Wales, where it has a subterraneous passage for about a mile; it emerges a little above the town of Mold, and ultimately falls into the Dee.

ALLENDALE, a parochial chapelry in Northumberland, with a population of 5540 inhabitants in 1831; containing the townships of East Allendale, West Allendale, Catton, and Keenly.* The first of these comprehends the market-town of Allendale, irregularly built on the right bank of the East Allen brook, (which flows into the South Tyne,) about 10 miles S.W. of Hexham, and 286 N.N.W. from London.

The chief employment of the inhabitants is furnished by the important lead-mines in the neighbourhood, or by the smelting-houses and other establishments dependent upon them. The perpetual curacy of Allendale is in the gift of Mr. Beaumont, who is lord of the manor, and proprietor of the whole of Allendale. The parish, which is in the diocese of York,† has lately been divided into four parts, with four places of worship of the Establishment, *viz.* the chapels of St. Peter, in the town of Allendale, and of Ninebanks, both rebuilt within a few years; and those of East and West Allen, recently erected for the use of the mining population. All these are in the gift of Mr. Beaumont. There are also meeting-houses for the Quakers and Wesleyan Methodists. A free grammar-school was founded about the close of the seventeenth century, and endowed by several individuals; a subscription library was founded in 1825. The market is on Friday, and there are three fairs in the year.

ALLERTON, NORTH. [See NORTHALLERTON.]

ALLEYN, or ALLEN (EDWARD), a distinguished actor in the reigns of Elizabeth and James I. By his own account, he appears to have been born on the first of September, 1566. The event, according to Fuller in his *Worthies*, took place in Lombard-street, in the parish of All-Hallows, London, at the sign of the Pye, near Devonshire House. It is stated in Lysons's *Environs of London*, vol. i., that his father was Edward Alleyn of Wyllyn in Bucks, and that his mother was a daughter of James Townley, Esq., of Lancashire. He seems to have very early taken to the stage, being distinguished as an actor before he was twenty-six. His natural talents for the profession he had thus chosen were aided by personal advantages of a high order. Fuller says that he 'made any part, especially a majestical one, become him.' He seems, indeed, to have been looked upon as the first performer of that day. Ben Jonson has addressed to him one of his epigrams, written in a highly encomiastic style, and concluding,

> ———' others spake, but only thou dost act.
> Wear this renown: 'tis just that who did give
> So many poets life, by one should live.'

One of his most celebrated parts was the Jew of Malta, in Marlowe's play of that name. In his prologue to that play, Thomas Heywood speaks of Alleyn as having acquired, by his acting in it, the character of Peerless, 'being a man,' he adds,

> 'Whom we may rank with, doing no man wrong,
> Proteus for shapes, and Roscius for a tongue.'

And a letter of George Peele, the dramatic poet, has been preserved, in which he tells a story of a convivial meeting of Alleyn, Jonson, and Shakspeare, where Jonson charged his brother poet with having been indebted to his observation of Alleyn for the famous directions about acting in Hamlet. The letter is given in Dr. Kippis's edition of the *Biographia Britannica*, as an addition to the original life of Alleyn, in which these and other testimonies in his favour are collected, and which is known to have been written by Oldys.

Alleyn eventually became a theatrical proprietor. He was sole owner of the Fortune playhouse, near Whitecross-street, Moorfields, which he built himself, and which the author of the *Historia Histrionica*, published in 1699, describes as 'a large, round, brick building.' He also, according to Lysons, whose account differs from that of Oldys, held, in partnership with a person named Henslow, a bear-garden, on the Bank-side, in Southwark; and this seems to have been his most profitable speculation. To this he added the office, which he purchased from Sir William Steward, of 'Chief Master, Ruler, and Overseer of all and singular his Majesty's games of bears, and bulls, and mastive dogs, and mastive bitches.' From these different sources he made a good deal of money, his bear-garden alone, Oldys affirms, yielding him sometimes five hundred pounds a year. There was also long preserved a tradition, that he found some treasure in the ground while laying the foundations of his playhouse in Whitecross-street.

According to the weak and credulous John Aubrey, in his *Natural History and Antiquities of Surrey*, (vol. i. pp. 190) it was a sudden apparition of the Devil, while Alleyn was acting the part of a dæmon in one of Shakspeare's plays, that first put him upon the project for which he is now chiefly remembered, the founding of Dulwich College, in the parish of Camberwell, in Surrey. But Alleyn, who had always been a religious man, never, we are told, during his life, neglecting an opportunity of attending church, does not seem to have thought it necessary, on dedicating his wealth to pious purposes, to withdraw from his connexion with the stage. On the contrary, we find him in his Diary recording the income he derived from his theatre and bear-garden, long after he had finished his college, and dutifully thanking God for it, as for all his other bounties. The buildings of the college, which were erected after a design of Inigo Jones, appear to have been in a considerable state of forwardness in 1614, and were finished in 1617. He had some difficulty at first in getting permission to settle his property in mortmain, principally in consequence of the opposition of Bacon, then Lord Chancellor, who, in a letter to the Marquis of Buckingham, dated 18th August, 1618, says, 'I like well that Alleyn playeth the last act of his life so well,' but goes on to state that, nevertheless, on the application made to the king for the requisite licence, he had reminded his Majesty of his late refusal to allow Sir Henry Savile and Sir Edward Sandys to found lectures at Oxford and Cambridge; 'foundations,' he adds, 'of singular honour to his Majesty, and of which there is great want; whereas hospitals abound, and beggars abound never a whit the less.' The licence, however, was at last signed on the 21st of June, 1619; and on the 13th September, in the same year, the college was opened in form, Bacon and many other distinguished characters honouring the ceremony with their presence. Alleyn took upon himself the office of master in the first instance, in so far at least as was implied by living in the house, and restricting himself to the regular allowance of that situation. But his first wife, Joan Woodward, whom he had married on the 22nd of October, 1592, having, on the 28th June 1623, died at the age of fifty-one, although he had bound the future masters to celibacy, he soon after married another lady named Constance, whom Oldys states to have been the daughter of a Mr. Hinchtoe, but whose father Lysons conceives to have been the celebrated Dr. John Donne, the poet. The tradition of the college, indeed, is that he was thrice married; but at any rate, he left no issue. He died at Dulwich, on the 25th of November, 1626, and was buried in the chapel of the college.

The members of Dulwich College are a master, warden, four fellows, six poor brethren, and six sisters, twelve scholars, six assistants, and thirty out-members. The original revenues amounted only to 800*l.* per annum, but have since greatly increased. On this account, the situation of master of the institution, who must be of the surname of Alleyn, or Allen, and, if possible, of kin to the founder, is now of considerable value. Dulwich College has, from its foundation, been celebrated for its collection of pictures: Alleyn himself left it some, and many more were afterwards added by Mr. William Cartwright, the comedian, who died about the end of the seventeenth century. But the most valuable accession has been from the bequest of the late Sir Francis Bourgeois, in 1810. For this noble collection of works of the old masters, a new gallery has been built, to which the public are admitted by tickets, which may be easily obtained. Dulwich College also received from Cartwright a large and curious collection of old plays, which the managers gave to Mr. Garrick in exchange for some modern publications. In the present library, the most curious relic is the original Diary of the founder, begun on the 29th September, 1617, and continued to the same day in the year 1622; from this diary Mr. Lysons has printed copious extracts.

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* The above division is given from a communication received from the neighbourhood; but in the Population Returns for 1831, the townships of East Allendale, West Allendale, Cotton (Catton), Keenty (Keenly), Broadside, and Forest, and the divisions for the collection of the parochial rates, amount to eight: Forest being divided into two, and Park division being added to the number. The difference of the statements is probably owing to the existence of different divisions for different purposes.

† The district of Hexhamshire, in which Allendale is included, was once a bishopric, and is now added to the diocese of York. The rest of Northumberland is in the diocese of Durham.

ALLGEMEINE ZEITUNG (i. e. *Universal Gazette*) is the name of one of the principal German newspapers. The plan for this publication was conceived in 1794, by the well-known bookseller, J. G. Cotta, of Tübingen, who invited Schiller to superintend the undertaking. Schiller declined the proposal, (in a letter, a lithographed fac-simile of which was appended to a recent edition of Schiller's works,) and Cotta himself was, for a time, the chief editor of the paper, till Huber, the son-in-law of Heyne, undertook the editorship. The paper appeared under the name of *Neueste Weltkunde*, (*i. e.* Latest Intelligence about the World,) till the 8th of September, 1798, when, in consequence of a prohibition issued against it under that designation, it assumed its present title. The Allgemeine Zeitung was published first at Tübingen, afterwards at Stuttgart, and subsequently at Ulm. Owing to certain difficulties arising from the censorship in the Würtemberg dominions, Augsburg was chosen for its publication, where it still experiences much liberality on the part of the Bavarian government. In allusion to its place of publication, the Allgemeine Zeitung is, in English and French newspapers, often called the *Augsburg Gazette* (*Gazette d'Augsbourg*). After Huber's death, in 1804, the superintendence of the Allgemeine Zeitung was undertaken by Stegmann, who had till then been attached to the Prussian diplomatic service, and had occupied the post of councillor of legation at Turin. The Allgemeine Zeitung has correspondents in all countries of Europe, by whom it is supplied with information; and the several German as well as foreign governments frequently avail themselves of it for the publication of semi-official articles. The supplements often contain literary news, especially brief reviews of works on politics, and biographic sketches of important public characters. Notwithstanding its acknowledged excellence, the Allgemeine Zeitung is said to have but a limited sale: the number of copies sold was, in 1823, stated by some to be 5000, by others only 1500—2000. (See the German *Real-Encyclopädie oder Conversations-Lexicon*, art. *Zeitungen*.)

ALLIANCE, THE HOLY, the name commonly given to the celebrated convention concluded at Paris on the 26th September, 1815, between the Emperors of Russia and Austria, and the King of Prussia. It is understood to have been proposed by the Emperor Alexander, and was signed by the three sovereigns with their own hands, without being countersigned by any minister. The document, which was first published by Alexander on Christmas day following, commenced by an announcement of the intention of the subscribing parties to act for the future upon the precepts of the gospel; which they define to be those of justice, Christian charity, and peace. Then follow three articles, the first of which, after narrating the scriptural command to all men to consider one another as brethren, deduces from it the somewhat limited inference, that the three contracting monarchs will remain united to each other by the bonds of a true and indissoluble fraternity, and that they will conduct themselves to their subjects and armies as the fathers of families; the second article can hardly be said to mean anything; and the third is merely an invitation to other powers to join the confederacy. When this treaty was communicated to the English court, a reply was returned to the effect, that the forms of our constitution did not permit the king formally to accede to it, but that no other power could be more inclined to act upon the principles which it seemed to involve. At this time many liberal politicians throughout Europe, especially in Germany, looked to the Holy Alliance with most sanguine expectations of its happy results. Its true object, however, was not long in beginning to show itself; and it at last became apparent, that the Christian and paternal intentions of its authors meant nothing else than simply a determination to assist one another in governing both their own dominions and as much of the rest of the world as they could, according to their own will and pleasure. This design may be considered as having been first distinctly announced in a circular issued by the three powers on the 8th December, 1820, from Troppau, where they were then assembled in Congress to consider the means of putting down the revolution which had just taken place in Naples. This note, which was addressed to the ministers and chargés d'affaires at the German and northern courts, drew from Lord Castlereagh, the then English minister for foreign affairs, a dispatch addressed to his majesty's missions at foreign courts, and dated the 19th January, 1821, in which it was intimated, that this government could not acquiesce in the principles announced in the circular of the three sovereigns, or in their proposed application. From that time England may be considered as having separated itself completely from the Holy Alliance; and since the death of the Emperor Alexander it may be difficult to say whether or not the convention so called is to be regarded as subsisting at all.

ALLIER, a river in France, called by the Romans Elvaer, which, rising in the mountains of Margeride, near the place where these branch off from the more important chain of the Cevennes, flows, with some trifling bends, in a direction nearly N. by W. Its basin is bounded on the east by the heights of Forez and La Made, which separate it from the basin of the Loire; and on the west by the volcanic mountains of Auvergne, the loftiest in central France. [See AUVERGNE.] Its broad but shallow stream winds through the rich district of Limagne, until, after a course of 125 miles, the junction of the Dore renders it navigable for a part of the year at least. From this junction it pursues its course until it falls into the Loire, a little below the town of Nevers, which is on the latter. Its whole course may be about 200 miles.

The river gives name to a department, which is bounded on the north by those of Cher, Nievre, and Saône et Loire, and on the south by those of Creuse, Puy de Dôme, and Loire. The Allier, soon after its junction with the Dore, enters the department from the south, and divides it into two parts; while the Loire itself forms its north-eastern boundary; and the Cher, with the Canal of the Duke of Berry, which runs parallel to the Cher, and close by it, crosses its western extremity.

The department comprehends a great part of the ancient province of Bourbonnais, and its productions are much diversified. Its granite rocks are covered with a light but fertile soil; while the valleys contain rich alluvial districts, which, however, owing to the backward state of agriculture, do not yield the crops which a more improved system of husbandry might produce. The vine is not cultivated to any great extent; but in the pastures many oxen are fattened, and the breed of horses is remarkable for strength. The woods are extensive, and furnish oak timber for shipbuilding. The meres or ponds also are considerable, and the fish taken in them, or in the numerous streams, form an article of trade with Paris. Coal-pits, iron-mines, quarries, from which stone suited for mill-stones is obtained, and pits of clay, adapted for making porcelain, are the chief mineral wealth of the department. Mineral springs attract visitors to the towns of Vichi, which is situated in a romantic country on the banks of the Allier, and to Bourbon L'Archambault, and Neris: the last, under the name of Aquæ Neræ, or Neri, was a watering-place in the time of the Romans; and the remains of an amphitheatre, and some other buildings, show it to have been a considerable place.

The department of Allier contains four arrondissements, those of Moulins, Montluçon, Gannat, and La Palisse. Its population in 1826 was 285,302. It is under the jurisdiction of the criminal court of Riom. This department is crossed by one of the great roads from Paris to Lyons.

The chief town is Moulins, on the banks of the Allier, [see MOULINS,] the population of which is 14,500. Gannat, on the Andelot, a branch of the Allier, 35 miles south of Moulins, carries on a considerable trade in cattle, and has a population of 5000. Between these is St. Pourçain, the seat of a large cattle fair in the month of August. Montluçon, near the baths of Neris, mentioned above, has 4500 inhabitants; Cusset, on the Allier, has nearly as many: its ancient walls give it the appearance of a strong place. Bourbon L'Archambault, also mentioned above, has about 3000, and La Palisse rather more than 2000. The department is not particularly distinguished by any manufacture; the inhabitants of the village of Lurcy Levy in the north make porcelain and earthenware, and those of Souvigny, near Moulins, trade in soda and glass. At Moulins itself some cutlery is made, which is in good repute, especially the scissars, and there are some other articles made, for which see the article on that town.

ALLIGATION, derived from the Latin *ad* and *ligare*, signifying to bind together, or unite. It is a rule in arithmetic, by which the price of a mixture is found when the price of the ingredients is known. This is an application to commercial arithmetic only, but the following questions, which fall under the rule, will show its scope better than any general definition.

How much wine at 60*s.* a dozen must be added to a pipe worth 95*s.* a dozen, in order that the mixture may be worth 70*s.* a dozen?

If a cubic foot of copper weighs 8788 ounces, and of zinc 7200 ounces, in what proportions must copper and zinc be mixed, so that a cubic foot of the mixture may weigh 8000 ounces?

For the algebraist we may say, that all questions fall under the rule of alligation which involve the solution of such an equation as,

$$ax + by + cz = n\,(x + y + z)$$

in which n must be intermediate between a, b, and c; which is indeterminate unless further relations between x, y, and z are given. Any person moderately skilled in algebra may reduce a question of alligation to an equation of this form; and as the number of cases is infinite, and several of those given in the books of arithmetic are practically useless, we shall here confine ourselves to an example of one process for the algebraical student, and two rules of the most simple cases for all other readers.

There are three ingredients, worth a, b, and c shillings per ounce: in what proportions must a mixture of m ounces be made, so as to be worth k shillings an ounce; it being understood that the quantities of the two first ingredients must be in the proportion of p to q? Let px be the quantity of the first ingredient; then qx is that of the second; let y be that of the third. Then by the question,

$$px + qx + y = m. \quad . \quad . \quad . \quad (1)$$

But px ounces, at a shillings an ounce, cost apx shillings; therefore the price of the whole is

$$apx + bqx + cy \text{ shillings,}$$

which by the question is km shillings: hence,

$$apx + bqx + cy = km, \quad . \quad . \quad . \quad (2)$$

and which two equations, with two unknown quantities, can be solved by the common method.

Rule I. Where the quantity of each ingredient, and its price, are given, to find the price per pound, gallon, or whatever it may be, of the mixture; multiply the quantity of each ingredient by its price, and add; then divide the sum of all these products by the sum of all the quantities in the ingredients.

Example. What is the worth per ounce of a mixture of 25 ounces of sugar at 10*d.* with 15 ounces at 11*d.*?

25 ounces at 10*d.* is worth 250*d.*
15 „ 11*d.* „ 165*d.*
40   40) 415 (10$\frac{15}{40}$*d.*
40
15

Answer, 10$\frac{15}{40}$*d.* or 10$\frac{3}{8}$*d.* very nearly.

Rule II. To find in what proportions *per cent.* two ingredients must be mixed, in order that the price per ounce, &c. of the mixture may be one which has been previously determined upon. To find the proportion of the *first* ingredient, take the difference of price between the mixture and the *second* ingredient, multiply by 100, and divide by the difference between the prices of the ingredients.

Example. I wish to know in what proportion wines at 45*s.* and 70*s.* a dozen must be mixed, in order that the mixture may be worth 55*s.* a dozen?

Price of the mixture . . 55*s.*
„ second ingredient 70*s.*
difference 15
multiply 100
difference of price of ingredients 25) 1500 (60
150
0

There must be, therefore, 60 per cent. of the first, and consequently, 40 per cent. of the second.

Instead of finding the proportions *per cent.*, the proportion in which any other number must be divided, may be found by using that number of dozen, &c. instead of 100, and the three prices may be *all* multiplied by any number which will clear them of fractions.

Example. How must 80 gallons, worth 6½*d.* a gallon, be made of ingredients worth 1¾*d.* and 11*d.* per gallon?

Price of mixture.	Price of first ingredient.	Price of second ingredient.
6½	1¾	11
4	4	4
26	7	44

difference of 26 and 44   18
80
difference of 7 and 44   37) 1440 (38$\frac{34}{37}$
111
330
296
34

Answer, 38$\frac{34}{37}$ gallons of the first, and 41$\frac{3}{37}$ of the second.

ALLIGATOR, a name originally given by the British Colonists of the Southern States of the North American Union, to a large species of reptile closely resembling the crocodile of Egypt, but which modern researches have shown to possess generical characters differing from those of that animal. The word is supposed to be derived from the Portuguese *lagarto*, signifying a lizard, generally; but it seems more probable, as, indeed, some of our older writers on the history and productions of America, affirm, that it is merely a modification of the Indian word *legateer*, or *allegater*. According to its modern acceptation among zoologists, however, the name is no longer confined to the species most commonly found in Carolina, Louisiana, and the other Southern States of the Union; but it is applied generically to all the other American species which agree with it in its most prominent and influential characters, and which have been called caymans, jacarés, &c., by the Spaniards, Portuguese, and Indians of South America. The characters which are proper to the alligators, and by which they are distinguished from the crocodiles of the Old World, are by no means of such importance with respect to the influence they may be reasonably supposed to have upon the habits and economy of these animals, as to warrant the formation of these reptiles into a distinct and separate genus: their manners and habits are precisely those of the true crocodiles, and if they differ in certain minor details of structure, this difference should be considered not as a *generic*, but as a purely *specific* character. Baron Cuvier regarded the alligators not as a distinct genus, but merely as forming a subgenus of crocodiles, differing from these animals in their habitat, but agreeing with them in all the essential parts of their structure and economy. Some later authors, however, have elevated his subdivisions into distinct and separate genera. Without subscribing to their views upon this subject, we shall so far adopt their plan, as to describe the alligators and crocodiles in different articles.

M. Cuvier thus distinguishes the alligators from the true crocodiles: 'the former have the head less oblong than the latter; its length is to its breadth, measured at the articulation of the jaws, as three to two; the teeth are unequal in length and size; there are at least nineteen, sometime even as many as twenty-two, on each side in the lower jaw, and nineteen or twenty in the upper. The front teeth of the under jaw pierce through the upper at a certain age, and the fourth from the front, which are the longest of all, enter into corresponding holes of the upper jaw, in which they are concealed when the mouth is closed. The hind legs and feet are round and neither fringed nor pectinated on the sides; the toes are not completely webbed, the connecting membrane only extending to their middle; and finally, the post-orbital holes of the cranium, so conspicuous in the true crocodiles, are very minute in the alligators, or even entirely wanting.' The crocodiles, properly so called, on the contrary, have the head at least twice as long as it is broad; fifteen teeth on each side of the lower jaw, and nineteen on each side of the upper. The incisor or front teeth, as in the alligators, pierce through the upper jaw, at a certain age, but the fourth or largest of the lower jaw, instead of being received into a corresponding hole of the upper, passes into a notch on each side of it; and finally, the hind feet are bordered by a denticulated fringe, and the toes are completely united by a swimming membrane.

The characters here reported as peculiar to the alligators and crocodiles respectively, are evidently not of sufficient importance to exert any very sensible influence upon their general economy. Of the characters and organic modifications which they possess in common, the principal is the long taper tail, strongly compressed on the sides, and surmounted towards its origin with a double series of keel-shaped plates, forming two upright denticulated crests, which, gradually converging towards the middle of the tail, there unite and form a single row to the extremity. Its great size, and laterally compressed form, render the tail an organ of the utmost importance to the crocodiles: it is true that its weight materially impedes their motions on dry land, but it is a most powerful instrument of progression in the water, and influences the aquatic habits of these animals much more than their webbed feet. The latter character, indeed, is comparatively of little weight: the hind feet are only used to assist the progression in slow and gentle motion, but in all sudden and violent actions the tail alone is the active instrument; and even when the animal is surprised on land, as we are assured by Adanson, it becomes a powerful weapon of offence. The compression of the tail is not peculiar among reptiles to crocodiles, though so powerfully influencing their habits; but the second character which is common to the entire genus, viz., the palmated or semi-palmated hind feet, is exhibited by no other genus of reptiles, though all are more or less addicted to an aquatic life. This fact sufficiently demonstrates the small influence which the palmated form of the extremities exerts upon the economy of these animals in general. Still this character is by no means devoid of importance, though in proportion to its utility in aquatic progression, it renders the terrestrial motions of the animals extremely slow and awkward; and this effect is still further increased by the length and weight of the tail at one end, and by the anatomical structure of the neck at the other. Each of the cervical vertebræ has on either side a species of false rib, and their meeting at the extremities along the whole neck, completely hinder the animal from turning its head to either side, and render all its movements stiff and constrained. Neither is the pace of the crocodiles on land so swift as to make them objects of fear to ordinary quadrupeds; a man can easily outstrip them, and so sensible are these animals of their own inferiority in this respect, that they immediately retreat to their more congenial element upon the most distant appearance of the human species.

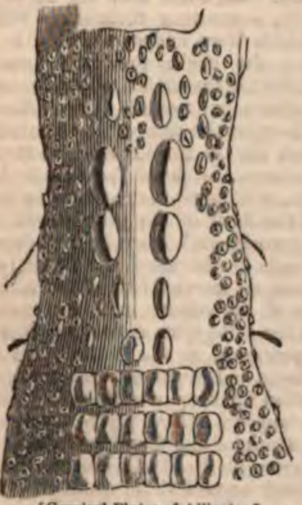
The other general characters of the crocodiles and alligators, consist in their long flat heads, thick neck and bodies, protected by regular transverse rows of square bony plates or shields, elevated in the centre into keel-shaped ridges, and disposed, on the back of the neck, into groups of different forms and numbers, according to the species. The mouth is extremely large, extending considerably behind the eyes, and furnished in each jaw with a single row of conical teeth, all of different sizes, and standing apart from one another: these are hollow within, and never vary in number, but are successively pushed out and replaced by others of larger dimensions, as the animals increase in age and size. The tongue is short and fleshy, and attached to the under jaw throughout its whole extent. It is consequently incapable of protrusion, and from its small size and backward position seldom seen even when the animal opens its mouth, which circumstance occasioned the belief so universally prevalent among the ancients, that the crocodile was altogether deprived of this organ. The eyes are placed on the upper surface of the skull, are much approximated towards one another, and provided each with three distinct lids: the nostrils form a long narrow canal, placed at the extremity of the muzzle; the ears are closed externally by two fleshy valves, and beneath the throat are two small pouches or glands, which open externally and contain a musky substance. Finally, the feet are provided with five toes before, long and separate, and four behind, more or less perfectly united by membranes: of these, the three interior alone on each foot are provided with claws, so that the two outer toes on the fore-feet, and one on the hind, are constantly clawless.

Such are the principal characters which influence the habits and economy of the crocodiles in general; those which more particularly distinguish the alligators or crocodiles of America from the kindred species of the Old World have been already adverted to, and it only now remains to relate the manners of the former sub-genus, and describe the distinctive forms of the different species which compose it. It is reported by Pliny, that the Egyptian crocodile retires to a secret cave or hiding-place, on the approach of winter, and spends three or four of the coldest months in a state of lethargy, and without taking any food: this phenomenon, usually called hybernation, is almost universal among reptiles and serpents, at least in temperate and high latitudes, and has been repeatedly observed with regard to the alligators. On the approach of the cold season these animals bury themselves in the mud at the bottom of some stagnant pond, where they remain concealed and inactive till the return of spring. Travellers assure us that they are never to be found in running streams, but that they frequent in preference some stagnant pond or the creeks of large rivers. Here they may be seen in almost countless multitudes, for they are extremely numerous in the remote, unfrequented parts of South America, protruding their large flat heads through the leaves of the *nymphæa*, *pontederia*, and other aquatic plants which cover the surface of the water, and watching for prey; or sometimes basking in the sun or sleeping on the banks. They never come on shore, except during the hottest part of the day, and always retire to the water on the approach of night, during which time they are extremely active in search of prey. Their food consists principally of fish, and it is conjectured by some physiologists, that the musky fluid, secreted by the glands under the throat which have been already mentioned, acts as a kind of bait to attract their prey. The alligators are seldom known to attack the human species, unless in defence of their eggs or young; the females of these reptiles are reported to exhibit a much stronger degree of maternal affection for their offspring than usually belongs to their class. They usually lay from fifty to sixty eggs in one place, of about the same size as those of a goose, which they cover up with sand, and leave to be hatched by the heat of the sun; never, however, removing to any great distance. When the young ones come forth, they are about five or six inches long, and are immediately conducted to the water by the female alligator. Seldom more than half the entire brood live to reach the water. Many are destroyed while in the egg. The vultures waylay and watch the female alligator when she goes ashore to deposit her eggs, which they scratch up and devour as soon as she retires. Numbers of them also fall a prey to the grown males of their own species, and to various descriptions of ravenous fishes which greedily devour them. The Indians eat the flesh of the alligators, notwithstanding its strong musky flavour; and even Europeans, who have succeeded in overcoming their prejudices so far as to partake of it, report it to be both delicate and savoury. A single peculiarity of habit seems to distinguish the alligators from the real crocodiles: the former never leave the fresh water, whilst the latter are known to frequent the mouths of large rivers, and even to pass between different islands, at considerable distances from one another; and so perfectly is this characteristic of the two subgenera, that the crocodile of the West Indian Isles differs from all the other American species, and exhibits only those modifications which properly belong to those of the Old World.

It was only at the commencement of the present century that the different species of alligators were properly distinguished from one another, or even that they were suspected to be specifically different from the crocodile of the Nile. This distinction is entirely due to the late Baron Cuvier, and since the publication of the first edition of his celebrated work, '*Sur les Ossemens Fossiles*,' little further addition has been made to the subject. He enumerates three species, which he has definitely characterised; and describes a fourth, which he suspects to be distinct, but of which he did not at that time possess a sufficient number of specimens to enable him to determine the question.. These are,

1. *The Alligator*, (*Crocodilus Lucius*, Cuv.) properly so called, which inhabits the fresh waters of the Carolinas, the Mississippi, and other southern parts of the United States, and of whose fierceness and voracity Bartram has related such extraordinary accounts. It grows, according to Catesby, to the length of fourteen or fifteen feet, the head being one-seventh of the entire length, and half as broad at the articulation of the jaws as it is long. It appears to be more fierce and voracious than the South American species, often attacks men and quadrupeds whilst bathing or crossing the rivers, and is even said to prefer the flesh of the negro to all other food; probably because the slave is more exposed to its attacks than his master. The alligators prey chiefly by night; they assemble in vast numbers, besetting the mouth of some retired creek into which they have pre-

viously driven the fish, and bellowing so loud that they may be heard at the distance of a mile. To catch the fish they dive under the shoal, and having secured one, rise to the surface, toss it into the air to get rid of the water which they necessarily take in along with it, and catch it again in its descent. When, however, they succeed in capturing a land animal, which is too large to be swallowed at a single mouthful, they conceal the body beneath the bank till it begins to putrify, for as their teeth are not formed for cutting or masticating, they are unable to tear the tough flesh in its fresh state; it is then dragged on shore and devoured at leisure. When about to lay, the female digs a deep hole in the sand, and deposits her eggs in layers, separated from one another by intervening strata of leaves and dry grass. It would appear that she lays only one batch of eggs during the same season, though in the hotter parts of South America, if the report of La Borde is to be depended on, the cayman, or alligator of Surinam and Cayenne, lays at two or even three different periods of the year; but as each batch is said to consist of only twenty or twenty-five eggs, it is probable that the whole does not exceed the number usually assigned to the common alligator. The female of this latter species, it is said, never loses sight of her nest till the young are hatched, and for months afterwards affords them the most unremitting care and protection.

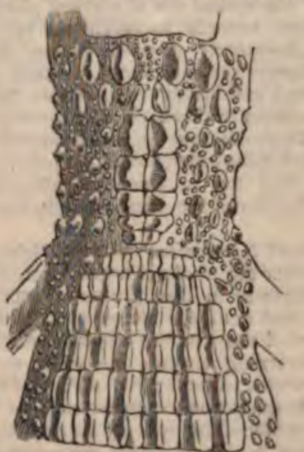


[Cervical Plates of Alligator.]

This species is frequently found up the Mississippi higher than the Red River. Messrs. Dunbar and Hunter encountered one in 32½° N. lat., in the month of December, and during a more than usually severe season. In general, however, as we are assured by Catesby and Lacoudrennière, the alligator of North America buries himself under the mud, at the bottom of the swamps and marshes which he inhabits, as soon as the cold weather fairly sets in, and continues in a lethargic sleep till the return of spring. During the very severe frosts, sensation is so completely suspended, that the body of the animal may be cut into slices without dispelling his lethargy; yet it is never actually frozen, and he partial return of a few hours' bright sunshine is at all times sufficient to restore suspended animation. It is particularly in the rivers, lagoons, and swamps of Florida, Georgia, South Carolina, and Louisiana, that the alligator reaches his greatest dimensions. Bartram found immense numbers of alligators and fish in a mineral spring near the Musquito River, in Florida, though the water, at its exit from the earth, was nearly at the boiling point, and strongly impregnated with copper and vitriol. The same traveller informs us, that the voice of the alligator resembles the bellowing of a bull.

Besides the characters common to all the American crocodiles, this species exhibits the following modifications which distinguish it from others. The snout is flattened on its upper surface, and slightly turned upwards at the extremity; the sides of it are nearly parallel, and the nose forms a regular parabolic curve. It was this similarity to the head of a pike, which led Baron Cuvier to bestow upon the present species the name of *Crocodilus Lucius*, or the pike-headed crocodile. The internal rim of the orbits is large and protuberant, but without being united by a transverse crest as in the *Crocodilus Sclerops or Spectacled Alligator*. The external openings of the nostrils are separated by a long knob; the skull has two shallow, oblique, oval pits, in the bottom of which are two small holes. On the back of the neck are four principal plates, elevated in the centre into keel-shaped ridges; and in front and rear of these respectively, two smaller ones of similar form. The back exhibits eighteen transverse rows of similar plates, the first with only two crests or ridges, then two with four, afterwards three with six, then six with eight, then again two with six, and finally, the last four rows with four crests each. The ridges or crests on the body, are of nearly equal size; those of the tail are much larger, and amount to thirty-eight in all, nineteen before the union of the two lateral series, and as many afterwards. The colour is a deep, greenish-brown above, and light-yellow on the under surface of the body; the sides regularly marked with alternate bands of both these colours.

2. *The Cayman*, (*Crocodilus Palpebrosus*, Cuv.) is at once distinguished from all other species by the bony structure of the eyebrows, which form large knobs of the size of a man's fist; and by the small extent of the membrane connecting the toes of the hind feet, which in prepared specimens can scarcely be recognized. The back of the neck is armed first with a range of four small scales, and afterwards with four transverse rows of plates, each consisting of two ridges, and immediately in contact with those of the back.



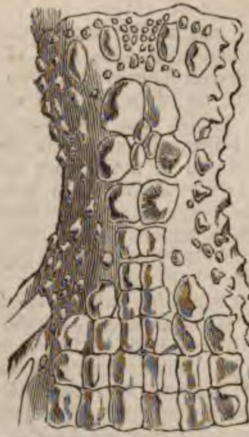
[Cervical Plates of the Cayman.]

These consist of one row with two ridges, one with four, five with six, three with eight, two with six, and seven with four. The lateral, denticulated ridges of the tail contain ten plates each before their union, and fourteen after, but as these are much more liable to vary than the transverse plates of the neck and back, little dependence should be placed upon the numbers of them in any species of crocodile. The skull of this species shows not the slightest trace of those postorbital perforations, which are so conspicuous in the crocodile of the Nile, and more or less developed in all the other species.

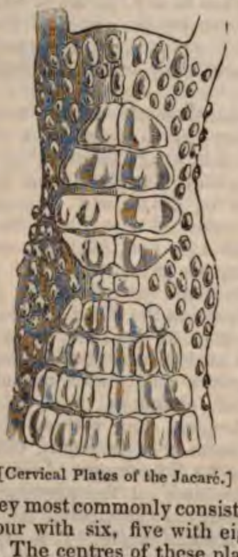
This is the common species of Surinam and Guiana: it is there called cayman, a word most probably of native origin, whilst the following species, which is likewise found in the same countries, though its more appropriate locality would appear to be Brazil and Buenos Ayres, is distinguished by the name of crocodile. Such at least is the report of Stedman and Von Sack, the only travellers who distinctly mention the present species. According to the account given by these travellers, the cayman does not attain so large a size as the other species, nor will he venture to attack a man on dry land, or even in the water, so long as he keeps his legs and arms in motion. The female deposits her eggs in a single layer, and after covering them slightly with sand, abandons them to the vivifying influence of the tropical sun, without taking any further charge either of them or of the young progeny.

3. The *Crocodilus Trigonatus* of Schneider, is a species of crocodile, exhibiting all the peculiar characters which properly distinguish the alligators of America, and yet suspected to be of African origin. It is even so closely allied in form and general characters to the cayman, or eyebrowed alligator, that Baron Cuvier has described it as a mere variety of that species, though the fact of its widely different habitat, if, indeed, it can be depended on, as well

as the different arrangement of its cervical and dorsal plates, are arguments in favour of the contrary opinion. The principal distinction between this and the foregoing species consists in a ridge which rises in front of the orbits, and runs towards the snout, and a small notch in the posterior border of the skull; the second row of cervical plates is larger than the others, and towards its middle are two or three small scales, with irregularly disposed crests; the large ridges assume the form of scalene triangles, which gives the whole animal a rough and bristly appearance; there are sixteen transverse bands on the back, the number of plates appearing to vary according to the species, and from nineteen to twenty-eight on the tail, nine or ten before the junction of the lateral ridges, and from ten to seventeen afterwards. Nothing whatever is known of the manners or habits of this species or variety.


[Cervical Plates of C. Trigonatus.]

4. *The Jacaré* (*Crocodilus Sclerops*, Schneider,) appears to be spread over the whole of tropical America, but is most especially numerous in Brazil, where it attains a very large size, and is found in all the rivers and lakes. Its head is more attenuated than in the alligator of North America; the sides converging towards the snout, so as to form very nearly an isosceles triangle; the surface of the bones of the skull has a rough scabrous appearance, as if arising from disease; the orbits of the eyes are surrounded by large, prominent rims of bone, and these are connected together by an intermediate ridge, giving the whole very much the appearance of a pair of spectacles; finally, the skull is pierced by two very small holes behind the orbits. The cervical plates are remarkably large; they are arranged in four transverse bands, of which the first two contain four each, and each of the others two. The transverse bands of the back vary according to age, and it would even seem according to the individual; they most commonly consist of two rows, with two plates each, four with six, five with eight, two with six, and four with four. The centres of these plates are elevated into ridges, much smaller than in the other species; it is only after the junction of the lateral ridges of the tail, that they become remarkably prominent; their number varies from ten to thirteen before this junction, and from nineteen to twenty-one after it. The colour of the animal is greenish brown above, marbled irregularly with different shades of green, and pale greenish-yellow below. This species grows to the size of from fourteen to eighteen feet in length; the whole length is from eight to eight and a half times that of the head.


[Cervical Plates of the Jacaré.]

The jacarés, according to Azara, are never known to attack men, or even dogs, in passing the rivers, unless it happen to be near the place where they have deposited their eggs; and even then, they are never known to prey upon the body, contenting themselves with the fish and water-fowl, which they find so plentiful in their own element. During the night they are exceedingly active, and always keep in the water, showing only their heads above the surface, but towards the middle of the day they come ashore to enjoy the heat of the sun; they then sleep profoundly, but always retreat to the water on being disturbed. The eggs are about the size of those of a goose; they are white, and much sought after by the free Indians, who also eat the flesh of the jacaré itself, though it has a strong musky smell, and scarcely any juice. The female deposits her eggs in the sand in a single layer, and covers them with straw or leaves; few of them, however, escape the quick eye of the vulture, and even many of the young fall a prey to the full-grown males, which at the period of their first appearance, in the hottest part of summer, are particularly fierce and ravenous, the marshes which they inhabit being then dried up, and their food difficult to obtain. This species appears to have pretty nearly the same range towards the south of the Continent, that the alligator, or pike-headed crocodile, has to the north. According to Azara, it is never found beyond 32° of south latitude. Many interesting facts regarding the habits of this species are recorded in the narratives of Prince Maximilian, Spix and Martius, and other Brazilian travellers.

ALLIGHUR. A district of central India, in the province of Agra, situated between the rivers Ganges and Jumna. This district is bounded on the north by Merut; on the south by the districts of Agra and Ferruckabad; on the east by the last-named district and Bareilly; and on the west by Agra and Delhi.

Allighur is estimated to contain a million and a half of acres, about one-third part of which is in cultivation, principally in the southern division of the district, which is very fertile. The northern portion, on the contrary, contains some of the most desolate tracts of land in India, in which little is to be seen but low, dark jungle.

In addition to the streams by which it is bounded on two sides, as already stated, the district is provided with numerous water-courses and rivulets, which, however, are dry during the greater part of the year.

The principal towns in the district are Allighur, Coel, Hatras, Moorsaun, and Anopsheher.

The first of these places is the capital of the district. It is situated in 27° 56′ N. lat., and 77° 59′ E. long., a little more than fifty miles north from the City of Agra. Allighur was taken in 1803, from Dowlut Row Scindia, by the forces under Lord Lake, and is now the head-quarters of a civil and judicial establishment of the Company's government. Coel, which is properly the town, is distant about two miles south of Allighur, and it is here that the civil authorities principally reside: the two places are connected by a fine avenue of trees. Coel was formerly a station of great importance, and is so spoken of by Abul Fazl in the *Ayin-i-Akbari*: it is still a large and busy town.

Hatras is a fortress of considerable strength, situated 31 miles north from the City of Agra. It was besieged in 1817, and taken by the British after a tremendous bombardment, which did great damage to the town. Hatras has become a place of much commercial activity.

Moorsaun, a town 29 miles north from the City of Agra, was, previous to 1817, the seat of an independent Zamindary, and the resort of tribes of professional robbers. The evil thus occasioned had arrived at such a height that, at the time just mentioned, the place was attacked by the English and dismantled. The country round about Moorsaun is highly cultivated. Anopsheher is built on the west side of the Ganges, 68 miles E.S.E. of Delhi, in 28° 33′ N. lat. 78° 8′ E. long. (Hamilton's *E. I. Gaz.* Mill's *History of British India; and Parliamentary Papers.*)

ALLITERATION. This term is usually employed to signify the juxta-position, or frequent recurrence in composition, of words commencing with the same letter, when introduced with a view to its rhetorical effect. Byron's line in the concluding stanza of the second canto of *Childe Harold*,

> *W*hat is the *w*orst of *w*oes that *w*ait on age,'

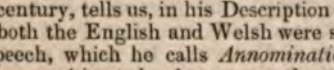
may be given as an example; and another instance occurs in the same stanza, in the line

> 'O'er *h*earts *d*ivided, and o'er *h*opes *d*estroyed.'

Churchill has at once ridiculed and exemplified the figure in his well-known verse

> 'And apt alliteration's artful aid,'

where every word begins with the same letter. Modern critics have detected numerous instances of alliteration both in the Latin and Greek poets. (See the dialogue entitled *Actius*, in the *Latin Dialogues* of Joannes Jovianus Pontanus; and Harris's *Philological Enquiries*, part II. chap. iv.) Alliteration, however, has been most systematically used as an ornament of diction in the Celtic and Gothic dialects. Gerald Barry, commonly called Giraldus Cambrensis, who lived in the twelfth century, tells us, in his Description of Wales, that in his day, both the English and Welsh were so fond of this figure of speech, which he calls *Annomination*, that they deemed no composition to be elegant, or other than rude and barbarous, in which it was not plentifully employed. The same tendency is also said to have formed a striking peculiarity in the genius of the Irish language. (See Warton's *History of English Poetry*, vol. ii. p. 148. Note d. Edit. of 1824.) Dr. Percy, in an essay published in his *Reliques of ancient English Poetry*, has traced the origin and history of alliterative verse down from the compositions of the old Icelandic poets. Nearly all the varieties of Runic verse, which were very numerous, appear to have depended for their prosodial character entirely upon alliteration. It was necessary that so many words in every line should begin with the same letter; and this was all that was required to make good metre. According to the learned Wormius, there were no fewer than 136 kinds of Icelandic verse formed upon this principle, and without including rhyme, or a correspondence of final syllables. If we may trust the following curious statement, given in a note by Mr. Park to the last edition by Price of Warton's *History of English Poetry* (vol. ii. p. 512,) the harmonies of alliterative verse were sometimes of the most complicated description, and such as were likely, one would suppose, to elude any except the nicest and most practised ears:—'An objection has been taken to the antiquity of the Welsh poetry, from its supposed want of alliteration. But this is not the case: for the alliteration has not been perceived by those ignorant of its construction, which is to make it in the middle of words, and not at the beginning, as in this instance:



This information was imparted to Mr. Douce, by the ingenious Edward Williams, the Welsh bard.' The remains which we possess of Saxon poetry exhibit frequent instances of lines constructed apparently upon the principle of alliteration; but it certainly was not so systematically adhered to in that language, as in the compositions of the Icelandic bards. Mr. Tyrwhitt, indeed, in his essay on the *Language and Versification of Chaucer*, has gone so far as to say, 'For my own part, I confess myself unable to discover any material distinction of the Saxon poetry from prose, except a greater pomp of diction, and a more stately kind of march.' He thinks that we might attribute the introduction of the practice of alliteration to the Danes, if we were certain that it made a part of the Scaldic versification at the time of the Danish settlements in England.

Dr. Percy, in the essay above referred to, has shown that poems continued to be written in English, the verse of which was merely alliterative, or in which, at least, alliteration served as the substitute for rhyme, down to the commencement of the sixteenth century, and in the Scottish dialect, even to a later period. One of the compositions of this description which he cites is entitled *Scottish Field*, and is a narrative of the battle of Flodden, which was fought in 1513. Another is a Scottish poem composed by Dunbar, who lived till about the middle of the sixteenth century. It is preserved in the Maitland manuscript, and has since been published by Pinkerton. The practice of alliterative verse, as Percy has remarked, seems to have been longest preserved in the north. In the *Canterbury Tales*, Chaucer makes his Parson, when asked for his story, reply, with a sneer at this antiquated habit of the northern versifiers of that day,

> '———Trusteth well I am a Southern man;
> I cannot *geste, rom, ram, ruff, by my letter*,
> And, God wot, rhyme hold I but little better;
> And therefore, if you list, I woll not glose;
> I woll you tell a little tale in prose.'

But the most famous poem in the English language, entirely composed in alliterative metre, is that entitled *The Visions of Pierse Plowman*, written about the middle of the fourteenth century, and attributed to William or Robert Longland, a secular priest, and a fellow of Oriel College, Oxford. This is a long work, consisting of twenty-one parts or books, and composed throughout in verses, the cadence of which appears to be generally anapæstic, but which are evidently designed to derive their chief metrical beauty from a certain artificial disposition, in each, of the words beginning with the same letter. The poem has been frequently printed; but the last and best edition is that published a few years ago by the late Rev. Thomas Dunham Whitaker.

So strongly had alliteration obtained possession of the English ear, that even for some time after the introduction of rhyme, it appears to have been still considered an important embellishment of verse. Some fragments of our old poetry exhibit both the consonance of final syllables, and a rigid observance of all the regularities of alliteration. Even after the latter came to be neglected as a systematic accessory, it was still lavishly employed as an occasional ornament. Our popular ballad and lyrical poetry is full of such lines as those with which the Scotch song commences:—

> '*M*erry *m*ay the *m*aid be
> That *m*arries the *m*iller;
> For *f*oul day and *f*air day, &c. &c.'

Down even to the present day, the use of alliteration, to a considerable extent, has continued to characterise English versification in its most polished form, and in the hands of some of our greatest poets. Nor has the employment of this artifice of style been confined to compositions in verse. In the early part of the seventeenth century it was carried to a greater excess by some of our prose writers, than it ever had been by our poets; grave discourses being elaborated, in which nearly all the words of each separate sentence commenced with the same letter. The longer this torture of the unfortunate sound could be protracted, the greater was deemed to be the feat of eloquence.

Those who recognize rhyme, or what Milton calls 'the jingling sound of like endings,' as one of the legitimate adjuncts of poetry, can hardly repudiate alliteration, which, after the same fashion, may be termed 'the jingle of like beginnings.' There can be no doubt that the latter artifice, judiciously employed, may be made to communicate a portion, at least, of the same sort of gratification which is conveyed by the former. The general principle upon which the pleasure we experience in both cases depends, is the similarity in dissimilarity, as it has been called, or variety combined with regularity, which is the occasion of so many of our intellectual, and of some also of our moral pleasures. Of course, the degree in which alliteration is employed, as an ornament of style, ought to be regulated by its importance, as compared with other rhetorical decorations, and by its appropriateness to the subject and the general character of the composition. Being a mere artifice of diction, it can in no case be compared with the higher beauties of thought and expression, and should never be obtruded so as to interfere with them. It sometimes serves, however, to help in what may be called the setting of a brilliant thought; and, if it have the air of coming naturally, will frequently add to the effect of an otherwise happy phrase. Its aptitude to catch the popular ear is proved by its almost universal adoption in proverbs, traditional rhymes, and other brief sayings of wit or wisdom, which their mere natural vitality has kept alive without the aid of letters, and even in a vast number of those idiomatic expressions which form the sinew and chief strength of our language. Mr. Price, the learned editor of the last edition of Warton, whose premature death is an irreparable loss to more than one department of our national literature, announced some years ago a volume which was to contain, among other matters, an essay upon alliterative metre, together with the Aunter of Sir Gawaine, a romance in alliterative metre, from a MS. of the fourteenth century; but the work, we believe, has never appeared.

ALLIUM, a very extensive genus of bulbous, monocotyledonous plants, belonging to the natural order *Asphodeleæ*. The species are all remarkable for having, in a greater or less degree, the odour of the garlic, and for the agreeable stimulating effects that accompany it. For this reason some of them have been objects of cultivation from the highest antiquity.

As a genus, allium is known among other asphodeleæ, by the flowers growing in round heads or umbels, by the perianthium being deeply divided into six spreading lobes, and by having a capsule with three angles, three valves, and three cells, sometimes so deeply lobed, as to have the appearance of six cells. The number of species is very considerable; they are almost exclusively natives of the northern hemisphere, and are principally found wild in the meadows and groves of Europe, in the north of Asia, and the north of Egypt; a small proportion only inhabiting corresponding latitudes in North America. Many of them are handsome flowering plants, but as they are more important on account of their useful properties, we shall confine ourselves to some account of the kinds commonly cultivated in the kitchen garden.

Allium cepa, the common onion, is too well known to require description. It is not certain of what country it is a native, but it has from time immemorial been cultivated in Egypt. Its varieties are not very numerous, considering that it is almost exclusively increased by seed: the most remarkable are the blood red, which is the most pungent; the Strasburg, which is the hardiest; the silver-skinned, which is the smallest, and the most fitted for pickling; and the Portugal and Tripoli, which are the largest and the most delicate. In this country the bulbs do not generally arrive at the large size of those imported from Portugal and Spain; but skilful gardeners have nevertheless succeeded in procuring them fully as fine. Their method has been to take the small onions of a late-sown crop of the previous year, and to plant them in rows in the beginning of April, laying them *on the surface* of the soil, each surrounded with about a handful of decayed and nearly dry manure. All the time that is usually lost in seed-sowing is thus avoided, and the moment the bulbs push forth new roots, they find themselves in the midst of an abundant store of food, which continues to supply them with nutrition during the whole of the growing season. As they advance in size, the soil round the bulbs is frequently disturbed by the hoe, for the sake of exposing as much as possible the carbonaceous matter of the manure to the action of the atmosphere. This process is only discontinued when the leaves begin to turn yellow; the bulbs are then allowed to ripen as usual. By these means—the copious supply of food, the bulbs being on the surface of the ground, and so enabled to develope without impediment from the pressure of the soil, and the time saved by using small, ready-formed bulbs, instead of seed,—onions have been often obtained in England fully equal in every respect to those of Spain. For further information on this subject, see the *Transactions of the Hort. Soc.* vol. i., p. 158, iii., p. 67, and iv., p. 138.

Allium schænoprasum, the chive, is a little tufted plant, with slender, cylindrical, taper-pointed, dark-green leaves; its flowers are arranged in a small, compact, round head, and are of a purplish or pale violet colour; the bulbs are small, long, and white, and grow in dense, matted tufts. It is a native of the Alps of Europe, from Lapland to Italy; and is found here and there in Great Britain. It is more employed by the French for their cookery, than in this country. Being a perennial, and increasing rapidly by its roots, it requires no other management than to be taken up from time to time for the purpose of separating its bulbs, which are afterwards replanted at short intervals. The leaves are the part eaten, and are cropped as occasion requires.

Allium fistulosum, the Welsh onion, is a native of Siberia, and is supposed to have gained its English name from having been imported originally from Germany, with the name Wälsch, or foreign, attached to it. It is a perennial, and cultivated chiefly for the purpose of being sold in the markets when very young, at which time its flavour is delicate; its hardiness enables it when young to brave our spring cold better than the common onion. It does not form bulbs, and is known by its tall stem, thick hollow leaves, and pale green very compact head of flowers. It does not appear to be an object of cultivation in any other than northern countries.

Allium ascalonicum, the shallot, a native of Asia Minor, is in many respects similar to the chive, from which it is known by its larger leaves, its smaller and more deeply-coloured flowers, and by its stamens having alternately three points on the filaments. It moreover produces bulbs of sufficient size to be fit for use, and accordingly, while the leaves only are employed in the chive, the bulbs are the parts sought for in the shallot. These multiply abundantly, so that every year, when the crop is taken up, there is plenty of small bulbs which can be reserved for planting the succeeding season, while the fine, fully-formed ones are selected for the kitchen. Two very distinct varieties of this useful plant are known, one of which is much larger and more delicate than the other. To obtain the bulbs in the greatest perfection, they should not be buried in the earth, as is the common practice, but merely placed on the surface of the soil, and treated as already recommended with regard to onions. Upon this subject see an excellent paper by Mr. Knight in the *Trans. of the Hort. Soc.*, vol. ii. p. 97.

Allium sativum, garlic, has been found wild in Sicily, and some parts of Provence. Its stem is simple, erect, and furnished with flat, narrow, pointed leaves; the flower-heads have usually a number of little bulbs lying among the flowers, which are white or pinkish; the bulbs are remarkable for the development of the greater part of the axillary buds of their scales; these buds grow rapidly, and acquire a bulbous state, and form what are called the cloves of the garlic, which are the parts employed in cooking. The mode of cultivating them is the same as that of shallots and onions.

Allium ophioscorodon, rocambole, or Spanish shallot, is very slightly different from garlic, being chiefly distinguished by its larger size in all the parts, and by the upper part of its stem being generally twisted spirally just before flowering. It is a native of most parts of the south of Europe; it is little cultivated in this country.

Allium porrum, the leek, has, like many other cultivated plants, disappeared in a wild state, so that its origin is unknown. It is a broad-leaved, succulent species, not capable of forming a bulb, because the leaves do not perish till the plant itself dies away, but producing instead a cylindrical body composed of the tender, colourless bases of the leaves, which are rolled round each other in a compact manner. As the excellence of the leek depends entirely upon the large size of this part, the attention of the cultivator is exclusively directed to that before all other considerations. It has been found that no method is so successful as to sow the seed early in a light and well-manured soil, and then, when the young leeks have arrived at the thickness of the little finger, or even sooner, to drop them into holes about 2½, or 3 inches wide, and 6 inches deep, in the bottom of which some very fine manure has been deposited. By this means the young plants are copiously supplied with moisture, have abundant food round their young roots, are attracted upwards by the light, and are enabled to develope themselves with rapidity from the absence of all pressure from the surrounding earth; and when they fill up the whole cavity of the hole, as they will in time, they then blanch themselves in all the most valuable part of their stem.

As the sensible properties of the whole genus are evidently much the same as those of the common onion, differing chiefly in degree of concentration or diffusion, the chemical analysis of the bulbs of this species may be considered illustrative of that of all the rest. MM. Fourcroy and Vauquelin found that the common onion is composed, 1st. of a white, acrid, volatile oil, holding in solution sulphur which renders it fetid; 2. of a vegeto-animal matter analogous to gluten; 3. of a good deal of uncrystallizable sugar; 4. of a great quantity of mucilage, resembling gum Arabic; 5. of phosphoric acid, either free or combined with lime, acetic acid, and a little citrate of lime, and 6. of vegetable fibre. It is to the volatile oil that the irritating properties of the onion are supposed to be owing, and they are consequently dissipated by heat.

ALLOA, a sea-port town and parish in the county of Clackmannan, on the north side of the river Forth, twenty-seven miles above Edinburgh, seven below Stirling by land, and fourteen by water. The town is very ancient and the old part of it irregularly built with narrow streets; but in the more modern part are some spacious streets, with handsome houses and good shops. Within the last few years, elegant streets have been formed towards the river, and several neat villas built in the vicinity of the town. The new church, opened in 1819, is an elegant structure in the Gothic style of architecture, and adorned with a fine spire 200 feet high. The inhabitants were chiefly indebted to the late John Francis, Earl of Mar, for this ornament to their town. There are three meeting-houses of presbyterian dissenters, an independent meeting-house, and an episcopal chapel. The town has an assembly-room, in which the public courts of the county are held, some religious associations, and a good subscription library.

The town and parish contain three large distilleries, five breweries, where ale is made which has long been in high repute, and two woollen manufactories, chiefly employed in the blanket and shawl trade. The glass-works are admirably situated at the river side, and they can, by a waggon-way, receive coals directly from the extensive coal-pits in the neighbourhood. Near these are the gas-works for lighting the streets, shops, and public works; and a little more to the westward a great iron-foundry has just been erected, chiefly for the making of steam-engines. The Devan iron-works, in the vicinity of the town, though in the parish of Clackmannan, contribute largely to the trade of this port. Bricks, tiles, and other earthenware, copper goods (especially distillers' apparatus), leather, tobacco, and snuff, are also extensively manufactured. The salmon fishery, although not now so productive as it has been in former times, is still carried on with considerable spirit. Alloa possesses a commodious harbour, which has lately been greatly extended, with a depth of water of sixteen feet at neap, and from twenty-two to twenty-four at spring tides. Its vessels sail to every quarter of the globe; and their tonnage is from 7000 to 8000 tons, giving employment to from 400 to 500 seamen. The coasting trade is also very extensive, the quantity of coals alone, carried coast-wise, and exported, annually amounting to 60,000 tons: the trade in malt also is very great, as Alloa supplies not only the distillers and brewers in the neighbourhood, but also distant markets.

There is a dry-dock next to the harbour, capable of receiving the largest ships; and a ferry over the Forth, with two large steam-boats, where the passage is rendered convenient at all times of the tide, by very complete piers, one on each bank, reaching down to low-water mark. In the river, which is here 500 yards broad, and separates into two branches, there are two low islands called *inches*, one of which, nearest the town, is a valuable farm of 80 acres. There is a daily communication by steam-boats with Edinburgh and all the towns on the Forth. Above Alloa, to the N.E. is a *dam*, called Gartmorn, made originally about the commencement of the eighteenth century, and covering about 160 English acres, being probably the largest artificial lake in Scotland. From it issues a stream which turns several mills, and serves other important purposes, besides cleansing the harbour. In the immediate neighbourhood of Alloa is an ancient tower, built prior to 1300, ninety feet high, with walls eleven feet thick, once the residence of the Earls of Mar, and the place where some of the princes of Scotland were educated. Some royal relics were consumed in a fire, which, about thirty years ago, destroyed the family mansion adjoining this tower. The present Earl of Mar has taken up his residence in a temporary house near the tower, till a proper mansion be built. Shaw-park, a seat of the Earl of Mansfield, purchased from the late Earl of Cathcart; and Tullibody-House, a seat of Lord Abercromby, are also in the parish. The population of the town in 1831 was 4417, of the town and parish, 6377. 56° 7′ N. lat. 3° 46′ W. long. from Greenwich.

ALLODIUM, or ALODIUM, property held in absolute dominion, without rendering any service, rent, fealty, or other consideration whatsoever to a superior. It is opposed to Feodum or Fief, (see Fief, Feudal System,) which means property, the use of which is bestowed by the proprietor upon another, on condition that the person to whom the gift is made shall perform certain services to the giver, upon failure of which, or upon the determination of the period to which the gift was confined, the property reverts to the original possessor. Hence arises the mutual relation of lord and vassal.

When the barbarian tribes from the northern parts of Europe overran the Western Roman Empire, in the fifth and sixth centuries, they made a partition of the conquered provinces between themselves and the former possessors. The lands which were thus acquired by the Franks, the conquerors of Gaul, were termed allodial. These were subject to no burthen except that of military service, the neglect of which was punished with a fine (called Heribannum) proportioned to the wealth of the delinquent. They passed to all the children equally, or, in default of children, to the nearest relations of the last proprietor. Of these allodial possessions there was a peculiar species denominated Salic, from which females were expressly excluded. Besides the lands distributed among the nation of the Franks, others termed *fiscal* lands (from Fiscus, a word which, among the Romans, originally signified the emperor's treasury, but was afterwards applied to all imperial property, both real and personal) were set apart to form a fund which might support the dignity of the king, and supply him with the means of rewarding merit and encouraging valour. These, under the name of *benefices*, (beneficia,) were granted to favoured subjects, upon the condition, either expressed or implied, of the grantees rendering to the sovereign personal service in the field. It has been supposed by some writers, that these benefices were originally resumable at pleasure, that they were subsequently granted for life, and finally became hereditary. But there is no satisfactory proof of the first stage in this progress. (Hallam, *Middle Ages*, vol. i. p. 161, *note.*)

From the end of the fifth to the end of the eighth century, the allodial tenures prevailed in France. But there were so many advantages attending the beneficiary tenure, that even in the eighth century it appears to have gained ground considerably. The composition for homicide, the test of rank among the barbarous nations of the north of Europe, was, in the case of a king's vassal, treble the amount of what it was in the case of an ordinary free-born Frank. A contumacious resistance on the part of the former to the process of justice in the king's courts, was passed over in silence; while the latter, for the same offence, was punished with confiscation of goods. The latter also was condemned to undergo the ordeal (see Ordeal) of boiling water for the least crimes; the former for murder only. A vassal of the king was not obliged to give evidence against his fellow-vassal in the king's courts. Moreover, instead of paying a fine, like the free allodialist, for neglect of military service, he had only to abstain from flesh and wine for as many days as he had failed in attendance upon the army. (Montesquieu, *Esprit des Loix*, lib. xxxi.)

The allodial proprietors, wishing to acquire the important privileges of king's vassals, without losing their domains, invented the practice of surrendering them to the king, in order to receive them back for themselves and their heirs upon the feudal conditions. When the benefices once became hereditary, the custom of what is called subinfeudation followed as a natural consequence; that is to say, the possessors of them carved out portions of their estates to be holden of themselves by a similar tenure. This custom began to gain ground even in the eighth century; but the disorders which ensued upon the death of Charlemagne in the ninth century, paved the way to the establishment of the feudal system upon a more extended basis. The vast empire which had been held together by the wisdom and vigour of one man, now crumbled into pieces. The provincial governors usurped the authority, and tyrannized over the subjects of his feeble descendants. The Hungarians, a tribe that emerged from Tartary at the latter end of the ninth century, spread terror and devastation over Germany, Italy, and part of France. The Scandinavian pirates, more commonly known by the name of Normans, infested the coasts with perpetual incursions. Against this complication of evils, the only defence was in the reciprocity of service and protection afforded by the feudal system. The allodial proprietor was willing, upon any terms, to exchange the name of liberty for the security against rapine and anarchy which a state of vassalage offered. In the course of the tenth and eleventh centuries (a period of the worst barbarism that Western Europe has known since the fall of the Western Roman Empire) allodial lands in France became for the most part feudal; *i.e.* either they were surrendered by their owners, and received back as simple fiefs, where the owner was compelled to acknowledge himself the *man* or vassel of some lord, on the supposition of an original grant which had never been made, or as *fiefs de protection*, where the submission was expressly grounded upon a compact of mutual defence. Similar changes took place in Italy and Germany, though not to the same extent. But in most of the southern provinces of France, where the Roman law prevailed, the ancient tenure always subsisted, and lands were generally presumed to be allodial unless the contrary was shown. And in Germany, according to Du Cange (*Gloss.*—tit. Barones) a class of men called *Semper Barones* held their lands allodially. With respect to England, it has always been a question whether the feudal system was established there before or after the Norman conquest. This subject will be more properly discussed under another head. (See Feudal System.) It is sufficient at present to observe, that at this day allodial possessions are unknown in England, all real property being held mediately or immediately of the king. The name for the most absolute dominion over property of this nature is a Fee, (Feodum,) or an estate in fee; a word which obviously implies a feudal relation. Hence it is, that, when a man possessed of an estate in fee dies without heirs, and without having devised his property by will, the estate escheats, *i.e.* falls back to the lord of whom it was holden, or, where there is no intermediate lord, to the king, as lord paramount. The term allodium is also sometimes applied to an estate inherited from an ancestor, as opposed to one which is acquired by any other means. (Spelman, *Gloss.* see Alodium.) The etymology of the word has given rise to much controversy. Sir H. Spelman, Dr. Robertson, Sir W. Blackstone, and others, have proposed several ingenious solutions of the difficulty, which are, however, founded on mere conjecture.

ALLOWANCE, in commerce, a deduction from the gross weight of goods, agreed on between merchants, according to the customs of particular countries and ports, the chief of which is known by the name of tare.

ALLOY. This word is employed to designate either a natural or artificial compound of two or more metals, except when mercury is one of them, and then the mixture is termed an *amalgam*. The natural alloys are far less important substances than those which are artificially procured: thus, arsenic occurs combined with the following metals, *viz.*, antimony, bismuth, cobalt, iron, nickel, and silver; there is also found a native alloy of antimony and nickel, and of antimony, cobalt and nickel; some others might be mentioned. But there is no instance of a native alloy, strictly speaking, being applied to any useful purpose, whereas the artificial alloys are of the highest importance both for the uses of common life and for manufacturing purposes; by uniting different metals, compounds are formed which possess a combination of qualities not occurring in any one metal. Platina is always employed in a pure state, and copper, iron, lead and zinc, are also very commonly so used; but gold, silver, tin, antimony and bismuth are generally alloyed; the first three, on account of their softness, and the two latter because they are extremely brittle. Gold and silver are hardened by alloying with copper; copper is hardened by zinc, &c.

The formation of alloys appears to depend upon the chemical affinity of the metals for each other; and in some instances it seems to be wanting, for no combination occurs: thus, according to Gellert, bismuth and zinc do not combine. Various facts may be assigned for supposing the combination to be the result of chemical affinity. M. Boussingault (*An. de Ch. et de Ph.* t. 34, p. 408) has described and analysed six different native alloys of gold and silver, and he found in all cases that the metals were combined in definite proportions. The change of properties which metals undergo by combining, furnishes strong evidence of its arising from chemical affinity and action: thus, with respect to colour, copper, a reddish metal, by union with zinc, which is a white one, gives the well-known yellow alloy brass: the fusing point of a mixed metal is never the mean of the temperature at which its constituents melt; and it is generally lower than that of the most fusible metal of the alloy.

All alloys formed of brittle metals are brittle; those made with ductile metals are in some cases ductile, in others brittle; when the proportions are nearly equal, there are as many alloys which are brittle as ductile; but when one of the metals is in excess, they are most commonly ductile. In combining ductile and brittle metals, the compounds are brittle, if the brittle metal exceed, or nearly equal the proportion of the ductile one; but when the ductile metal greatly exceeds the brittle one, the alloys are usually ductile. The density of alloys sometimes exceeds, and in other cases is less than, that which would result from calculation; the following alloys afford examples of increased and diminished density.

Increased.			Diminished.		
Gold	and	zinc	Gold	and	silver
Gold	,,	tin	Gold	,,	iron
Gold	,,	bismuth	Gold	,,	lead
Gold	,,	antimony	Gold	,,	copper
Gold	,,	cobalt	Gold	,,	iridium
Silver	,,	tin	Gold	,,	nickel
Silver	,,	bismuth	Silver	,,	copper
Silver	,,	antimony	Iron	,,	bismuth
Silver	,,	zinc	Iron	,,	antimony
Silver	,,	lead	Iron	,,	lead
Copper	,,	zinc	Tin	,,	lead
Copper	,,	tin	Tin	,,	palladium
Copper	,,	palladium	Tin	,,	antimony
Copper	,,	bismuth	Nickel	,,	arsenic
Copper	,,	antimony	Zinc	,,	antimony
Lead	,,	bismuth			
Lead	,,	antimony			
Platina	,,	molybdenum			
Palladium	,,	bismuth			

Not only are the properties of metals altered by combination, but different proportions of the same metals produce very different alloys. Thus, by combining ninety parts of copper with ten parts of tin, an alloy is obtained of greater density than the mean of the metals, and it is also harder and more fusible than the copper; it is slightly malleable when slowly cooled, but on the contrary when heated to redness, and plunged into cold water, it is very malleable: this compound is known by the name of *bronze*. If eighty parts of copper be combined with twenty parts of tin, the compound is the extremely sonorous one called *bell-metal;* an alloy consisting of two-thirds copper and one-third tin, is susceptible of a very fine polish, and is used as *speculum metal*.

It is curious to observe in these alloys, that in bronze, the density and hardness of the denser and harder metal are increased by combining with a lighter and softer one; while, as might be expected, the fusibility of the more refractory metal is increased by uniting with a more fusible one. In bell-metal, the copper becomes more sonorous by combination with a metal which is less so: these changes are clear indications of chemical action.

It has been already observed, that the natural alloys, considered as such, are not important bodies; the only one, if indeed that may be so reckoned, is the alloy of iron and nickel, constituting meteoric iron, and of which the knives of the Esquimaux appear to be made. The artificial metallic alloys are of the highest degree of utility: thus, gold is too soft a metal to be used either for the purposes of coin or ornament, it is therefore alloyed with copper; silver, though harder than gold, would also wear too quickly, unless mixed with copper; and copper is improved, both in hardness and colour, by combination with zinc, forming brass.

The following, among other useful alloys, will be treated of under their specific names, viz., Bell-Metal, Brass, Bronze, Gun, Pot, Prince's, Speculum, and Type Metal, Tutenag, and Solders. Other alloys will be described when the more impertant metal entering into their composition comes under consideration.

ALLSPICE. [See Eugenia.]

ALLU'VIUM, a name given to those accumulations of sand, earth, and loose stones or gravel brought down by rivers, which, when spread out to any extent, form what is called *alluvial land*. The word is derived from the Latin verb *alluere*, signifying 'to wash upon,' as the sea does upon the coasts, or a river upon its banks, and is chiefly used as a term in geology. Many geologists restrict the expression to such water-worn materials as have been deposited either recently or within the historical æra, and which do not include the remains of extinct species of organized bodies: but as there are similar accumulations of transported materials, belonging to almost every geological period in the history of the earth, it is an unwarranted restriction of the term to confine its use to the recent period only. There is, no doubt, this distinction between modern alluvia and those of ancient periods, that in the latter, besides the remains of extinct species of animals and plants, there is more frequently a consolidation into stone. To these last accumulations of water-worn materials some geologists apply the name *diluvium*, which is objectionable, because it expresses, not a particular state of the materials, but *a theory* of their formation; that is, that they were produced by a deluge—some indeed go so far as to assert that they were accumulations by the Mosaic flood. The word alluvium might be conveniently used as a general term, and we might say *ancient alluvium* and *modern alluvium*, as the French geologists say *terrains de transport—anciens* and *modernes*. We might go farther, and say secondary and tertiary alluvium, and the alluvia of particular groups of strata.

In treating of this subject we have to consider three operations: 1. the disintegration and decay of the superior crust of the earth by the action of meteoric agents, of tides, currents, and streams of running water; 2. the transportation of the loosened materials by streams and currents; and 3. the deposition of the matter at the bottom of rivers, lakes, æstuaries, and the ocean. The surface of the earth is subject to unceasing changes from the operation of three great classes of agents, viz., the meteoric, the aqueous, and the igneous. Under the first of these classes are comprehended, the air of the atmosphere, the vicissitudes of heat and cold, moisture and rain, light, electricity, and the wind: under the second class, running water of every kind on the surface of the land, the tides, waves, and currents of the sea as they strike against its shores: the third class comprehends volcanos and earthquakes, which will be discussed under another head. It is with the second class which we have chiefly to do at present, and we shall only briefly touch upon the first as subservient to the subject with which we are occupied.

All rocks, and indeed almost all mineral substances, have a greater or less tendency to combine with the oxygen of the atmosphere, especially when under favourable circumstances of heat and moisture, and probably also of electricity and light: carbonic acid and water also are absorbed by rocks in considerable quantity; and the effect of these combinations, whether chemical or mechanical, is to loosen the cohesion between the particles of the stone, and induce a tendency to disintegration. This separation of the parts is very much accelerated by those sudden expansions and contractions which are occasioned by vicissitudes of temperature, and especially during frost, when the imbibed moisture is converted into ice. This slow and silent work of waste is unremittingly going on wherever rocks are exposed to the weather. No species of stone is exempt; and even granite, which in general is so little subject to change as to be proverbially a symbol of endurance, and is selected for our bridges and other great works of architecture, under particular circumstances of constitution and exposure, is remarkably disposed to disintegration. 'The granite of some parts of Finland,' says Mr. Strangways, 'is so liable to decomposition, that a great boulder of it may often be seen with a hole cut in it large enough to admit a cart and horse; and the stone, though at a small distance it seems calculated to last for ages, is cut down and shaped away with the same ease, and much in the same manner, as a hay rick.' The same agents sometimes give more marked proofs of their destructive power, when lightning shivers a pinnacle of rock, or when a mass of water, enclosed in a cleft and converted into ice, rends, by its great expansive force, vast blocks asunder. The effect of these several indefatigable agents, all working together, with gravity in their favour, is a system of universal decay and degradation, which may be traced over the whole surface of the land, from the mountain-top to the sea-shore. The wind, though it may sometimes detach particles, is chiefly instrumental in transporting to a distance matter already separated. Every drop of rain that falls, as soon as it touches the earth becomes an instrument of destruction, and the minute fragments which every shower washes away are hurried along the streams into a river, and are either deposited at a lower level, or are transported to the sea: thus, a solid body which once formed a part of a mountain-top among the Andes, after being swept along for thousands of miles through the bed of a river into the waters of the Atlantic, may, by ocean currents, be deposited at the bottom of the Gulf of Mexico, while the fragment with which it was once united may be carried far into the depths of the Pacific.

To this assertion of the constant waste of the land, and the conclusions which are drawn from it, it has been objected, that we can hardly discover any change in the shapes and altitudes of mountains, that the forms of many lands have continued unaltered since the earliest records, and that even productions of human art exposed to the action of the weather for many centuries have undergone no perceptible decay. No doubt the process is slow, if compared with the progress of events in which the human race has had concern, but no one will deny that rivers are loaded during every flood with solid matter; and, as the matter so suspended can only be derived from the land, it necessarily follows that a continuance of the process must in time wear down the loftiest mountains, where the rocks are not protected by a covering of turf from the action of the destructive agents. Of the rapidity of this waste we have no means of judging, and any attempt to express our conjectures by figures would be little better than an idle occupation. It is almost within our own time that any accurate measurements of heights have been made; and as two estimates of the same mountain, made with all the accuracy of which our instruments are capable, often give a difference of several feet, we are not even now able to leave behind us data by which posterity may mark the progress of this species of geological change; for the removal of such a mass of matter as should diminish the height of a mountain by three or four feet, by ordinary agents, may require thousands of years for its accomplishment. If Mont Blanc, by our most accurate measurements, be now 15,744 feet above the level of the sea, and if the geologist, many centuries hence, by newly-discovered methods not liable to error, should find it only 15,740, it would be impossible for him to know whether the difference was to be set down to geological change, or to the imperfection of the instruments of his ancestors.

In geological speculations we must lay aside all considerations as to time: we have only to do with that element when our inquiries relate to man; and if we are to be guided by analogy in our reasonings, we must be satisfied that a space of time of vast duration must have been requisite to produce any great amount of geological change. We see even in many chemical processes, that long-continued action gives birth to substances which could not otherwise be obtained,—as, for example, crystals of felspar are formed if the heat be maintained for some weeks, but not otherwise; and long-continued action in the great laboratory of nature has no doubt been an equally powerful instrument.

Although we can, in strictness, only say that certain geological events must have preceded others, we are not warranted in withholding any length of time for the accomplishment of the change, merely because we are unable to form a conception of an indefinite period: it would be as irrational as if we were to withhold our assent to some of the established truths in astronomy, merely because we are incapable of forming an idea of indefinite space. It has been eloquently said by Playfair, that 'it affords no presumption against the reality of the progress of decay, that, in respect of man, it is too slow to be immediately perceived. The utmost portion of it to which our experience can extend, is evanescent, in comparison with the whole, and must be regarded as the momentary increment of a vast progression, circumscribed by no other limits than the duration of the world. TIME performs the office of *integrating* the infinitesimal parts of which this progression is made up; it collects into one sum, and produces from them an amount greater than any that can be assigned.' But slow and silent as the work of these agents of destruction is, we have only to direct our view towards those parts of the earth where the machinery of nature is to be found on its grandest scale, to be sensible of the prodigious effects which their unceasing operation must produce in the long lapse of ages.

The force of water, when directed against any obstacle in its course, is very considerable, even by its own weight alone, especially if it be flowing over a highly-inclined surface, but its destructive power is greatly augmented if it be loaded with sand and gravel. In floods, very considerable blocks are carried by the stream to great distances, for it must be remembered that these are much more easily moved in water than on land, in consequence of the law in hydrostatics, that a solid body fully immersed in water weighs so much less than it does in air by a sum equal to the weight of the mass of water which it displaces. If the water flows with a velocity of three inches per second, its force, when free from suspended matter, is sufficient to tear up fine clay; six inches per second, fine sand; twelve inches per second, fine gravel; and three feet per second, will tear up beds of loose stones of the size of an egg. The flood occasioned by the bursting of the barrier of a lake in the valley of Bagnes near Martigny, in the Vallais, moved at first with the tremendous velocity of thirty-three feet per second, afterwards diminished to eighteen and eleven, and at the end of its course, when the water reached the Lake of Geneva, it was still running at the rate of six feet per second. From the barrier to this point, the fall is 4187 Paris feet, the distance is forty-five miles, and the mass of water passed over this space in five hours and a half. It swept along houses, bridges, and trees; masses of rock equal in dimensions to houses, which it tore out of an ancient alluvial soil, were carried a quarter of a mile down the valley. A flood, that happened in the north of Scotland in 1829, afforded numerous examples of the power of running water to transport large blocks of stone. On the river Nairn, a fragment of sandstone rock, 14 feet long, by 3 feet wide and 1 foot thick, was carried above 200 yards down the river. The river Don forced a mass of 400 or 500 tons of stones, many of them 200 or 300 pounds weight, up an inclined plane, rising 6 feet in 8 or 10 yards, and left them in a rectangular heap, about 3 feet deep, on a flat ground. The small rivulet, called the College, in Northumberland, swollen by a flood in August, 1827, carried several masses of stone, weighing from a half to three-quarters of a ton, 2 miles down its course; a large block, weighing nearly 2 tons, was transported to the distance of a quarter of a mile.

Thus it appears that the instruments of waste employed by Nature are far more powerful in their effects than is generally supposed. It is also evident that such powers, unremittingly exerted, must, after a long period, cause changes in the configuration of the earth's surface, and we shall now proceed to point out some of the effects which are produced by the working of this powerful machinery.

The cause of the formation of valleys is a subject of great controversy among geologists. Some ascribe their formation to extraordinary floods, waves, or deluges, which in their sudden passage scooped out the land; others, to the gradual effect of those natural agents, of whose existence and power we have had experience. It may fairly be presumed that, when the continents were raised out of the sea, their surfaces did not present a uniform plain, but were broken by numerous ridges and inequalities, and that the ridges themselves were traversed by numerous fissures, one of the effects of the power by which they were raised. The first rains that fell, and the first springs which burst forth, would necessarily collect in the lowest levels, and thus the direction of the great trunk of a river would be determined; and it might also happen that other clefts—depressions at a higher level—would communicate with this main channel. But that every such great depression would have a direct communication with the sea, and that such a combination of subordinate valleys as compose a river system, could have been formed by the breaking up of the earth's crust, either by elevation or subsidence, can hardly, we think, be maintained by any one. A river-course, or system, may be not inaptly compared to a picture of a great tree, whose branches gradually diminish in size, but increase in number, as they recede from the stem. The great trunk of the river is divided into many branches, which spring from it at various distances from one another; and these again are subdivided into an infinity of smaller ramifications, each diminishing in size as it increases in distance from the main trunk,—a regular communication being kept up between every point and the line of greatest depression; 'forming together, a system of valleys communicating with one another, and having such a nice adjustment of their declivities, that none of them join the principal valley either on too high or too low a level.' Some idea may be formed of the extent to which the surface of the land has thus been furrowed by means of the subordinate streams that feed a great river, from what Riede says of the tributaries of the Isar, which, flowing from the Tyrolese Alps and passing by Munich, joins the Danube some miles above Passau. This river is fed on its right bank by 433 streams, on its left by 800; the former joining the main bed by 59 channels, the latter by 44. But the Isar is only *one* of the thirty-four great branches of the Danube, and holds only a fourth rank among them; and even the Danube is a river of the third magnitude in the physical history of the earth.

We have direct proofs of the power of water to wear a channel in the hardest rocks in almost every country, and even in a remarkably short time. A stream of lava, poured out from Ætna in 1603, flowed across the bed of the Simeto, the largest river in Sicily, which flows along the base of the mountain, and falls into the sea near Catania. The stream has now cut a passage through the hard rock, which is only a little less compact than basalt, to the depth of from 40 to 50 feet, and from 50 to several hundred feet wide.

The Nerbuddah, a river of Hindostan, has worn a channel in a basaltic rock to the depth of 100 feet. Messrs. Sedgwick and Murchison state that, in the enormous masses of horizontal, coarse conglomerate, found in many of the valleys of the Eastern Alps, rivers have often scooped out gorges to the depth of 600 or 700 feet; and that in the valley of the Inn, near Innspruck, and in that of the Drave, between Klagenfurt and Marburg, there are splendid examples of these phenomena.

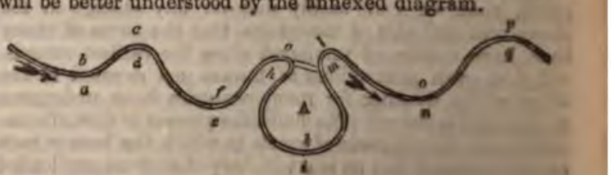
The rock, over which the water of the Niagara is precipitated at its celebrated Falls, is undergoing a daily waste; so that the cataract has receded nearly 50 yards in the last 40 years. The river below the Falls runs in a channel above 150 feet deep, and 160 yards wide, for a distance of 7 miles, where it emerges into a plain; and this channel has evidently been formed by the same operation as that which is now in progress. The waste is accelerated by the action of the water at the Falls on an under-bed of soft clay, which being washed away leaves the superincumbent limestone strata unsupported, when they fall down in huge masses. A similar effect is produced, even in mountains of considerable elevation, when the superficial water, or underground springs, obtain access to an inferior bed of soft materials, and gradually wash it away. This took place in 1806 at the Rossberg, near the lake of Zug, in Switzerland, a mountain more than 5,000 feet above the level of the sea. The stony masses which were undermined were inclined at an angle of 45°; and thus slid down, covering the valley below with an enormous heap of blocks of stone and earth, and overwhelming several villages, in which above 800 persons perished.

There are many valleys and narrow defiles which, on account of deep lakes that occur in them, the barriers by which they are enclosed, and the levels of the adjoining country, could not have been formed by the action of the waters now passing through them, however much we may suppose them to have been swollen by floods. In such cases, elevations and subsidences of the land, brought about by those subterranean agents which give rise to earthquakes, must be looked to as the most rational explanation. But there is, perhaps, not one of these which has not been subsequently modified in a considerable degree by the action of running water operating during a long period.

The wearing and transporting powers of rivers depend upon the volume of water, the quantity and size of the solid matter suspended, and the velocity with which it moves. A river generally runs with greatest rapidity in the higher parts of its course, where indeed it often consists of a succession of torrents and cataracts for many miles, but it has not yet acquired its full destructive force, because the mass of water is still comparatively small, nor has it yet become loaded with solid matter. In the lower part of its course, long before it joins the sea, it has usually reached a level country, and there its velocity becomes greatly retarded. The Senegal in Africa does not, according to Adanson, fall more than two feet and a half from Podor to the sea, a distance of sixty leagues. The destructive force is thus lessened by the diminished velocity, and by the consequent inability of the stream to drag its heavy artillery along with it. It is, therefore, in the middle part of its course that a river commits the greatest waste—after it has acquired a considerable volume, has become loaded with solid matter, and, from the inclination of the ground, still possesses power to wield its more mighty weapons of destruction.

The increase of the volume of water in rivers during the flood seasons is often prodigious. The bed of the Mississippi, at Natchez, about 300 miles above New Orleans, measuring along the course of the river, scarcely exceeds a mile in breadth when the water is low, whereas in the flood season the mass of waters is nearly thirty miles wide. The Orinoco, at St. Thomas's, 200 miles from its embouchure, is about three miles and a half wide in the dry season; but when flooded, its waters, according to Dupens, stretch out to the enormous breadth of seventy miles.

The loss of destructive power, by diminished velocity in the level country, is sometimes compensated, in a considerable degree, by the effects produced by the weight of the great volume of water impinging upon certain parts. This will be better understood by the annexed diagram.



When the river, in its oblique course at the entrance of the plain, strikes against the bank *a*, it speedily forms a steep or vertical cliff which turns off the water in its downward course into an opposite direction. The river now falls with its whole force against the point *c*, which, in its turn, becomes precipitous, and deflects the water towards the point *e*; and in this manner the process is repeated, at short intervals, producing a series of salient and re-entering angles.

The diagram represents a river after the process of erosion has considerably advanced; at first the course would be much less tortuous. If the country be composed of rock, both banks are usually steep; but if the ground consist of looser materials, the spaces between the precipitate parts of the banks—that is, between the salient angles—consist of flat, fertile, alluvial land, with a gravelly bottom, the gradual creation of the stream. Sometimes the course of the river is so tortuous that two points, *h* and *m*, may be within a few hundred yards of each other, and yet, following the line of the stream, they may be some miles asunder. In this case, the narrow neck of land is acted upon doubly; for the force of the water is directed against it on each side. In time this isthmus is breached, and the river either flows entirely through the new channel, or, dividing, forms the land A into an island.

Such tortuous courses, when they are cut through solid rock, as in the case of the Moselle, whose banks are sometimes 600 feet high, are among the strongest proofs of the destructive power of running water, for no sudden deluge, however powerful, could have scooped out such a trough; and that a cleft of such a nature should be occasioned by any disruption of the earth's crust, is not less improbable. More sudden, and therefore more striking, instances of the waste of the land occur where a river flows through a lake, and by its wasting action causes a breaking-down of the barrier. We have already alluded to the bursting of a lake in the valley of Bagnes in Switzerland. That flood was produced by the melting of ice which, falling in successive seasons from neighbouring glaciers, had formed so continuous a mass as to dam up the water of a stream which flowed in the bottom of the valley. If the barrier of a lake consist of strata of rock, supported by beds of clay or sand, and if, by any change of circumstances, the running water get access to this inferior bed, and gradually wash it away, the superincumbent rock, thus undermined, suddenly breaks down, and devastation and ruin overwhelm the country below. Such an event took place, in the year 1810, in the state of Vermont, and is described minutely by the Rev. S. Dwight, in *Silliman's Journal* for June, 1826. By the washing away of an under-bed of sand, the barrier of a lake suddenly burst, making an opening a quarter of a mile wide and 150 feet deep, through which the whole contents of the lake, a mile and a half long, three-quarters of a mile wide, and from 100 to 150 feet deep, were emptied in a few minutes. The liberated water rushed down a declivity to a lower lake, excavating a channel of a quarter of a mile in width, and from fifty to eighty feet deep. The accumulated torrent swept away the retaining mound of the lower lake in a moment, and, following the course of the insignificant stream which flowed out of the lower lake, rushed along a rapid descent of five miles, and then strewed its spoils over a flat country. Through all the descent it hollowed out for itself a path from 300 to 600 feet in width, and from twenty to sixty feet in depth, so that every trace of the original bed of the river disappeared, which was left to choose for itself a new bed, many feet below the old one, in the bottom of the valley. Seventeen miles below the lake the torrent retained so much of its force as to move a rock (estimated at 100 tons in weight) several rods from its bed. Thirteen years afterwards, Mr. Dwight found the former bottom of the lake dry; the original water-level marked by strong lines on the sides of the valley, a counterpart of the celebrated parallel roads of Glen Roy, in Scotland; and the small streamlet which fed the lakes flowing as before, and little more than a yard in breadth.

The distance to which the detached fragments are carried depends upon the volume of water, and the nature of the ground over which it flows. The torrents from the south-western Alps, rushing over a steep uninterrupted slope, transport large blocks to the sea; but a river that runs through a long stretch of level country deposits the grosser matter in the upper part of its course, and carries to its mouth only that which is more easily held in suspension. The larger stones, after being detached from their parent rock, have therefore to undergo an intermediate process of abrasion, by being rubbed against each other in the bed of the stream before their particles are finally committed to the deep. If a river pass through a lake in its course, the solid matter will be deposited in that trough until it has filled it up; and if the lake be very large, even the lighter particles will have time to fall, and the water will flow out clear from the other extremity. The Lake of Geneva affords a remarkable instance of this process; for the Rhone, where it enters, is extremely turbid; but at Geneva, where it leaves the lake, it is beautifully transparent. At the upper end there is a tract of alluvial land nearly eight miles in length, which has been gradually formed by the deposits from the river; and some measure of its progress is obtained by the change in the situation of the town of Port Vallais, which was once at the water's edge, but, in the course of about 800 years, has been left a mile and a half inland. Other torrents, on both sides of the lake, likewise pour in large quantities of solid matter; and thus, although, from its great depth, a long period must elapse if the present order of nature remains undisturbed, the Leman Lake will be converted into green meadows, and cattle will graze where there are now 160 fathoms of water. Nor is this an extravagant expectation, or more than has taken place elsewhere in past times. The vast fertile valley between the Vosges Mountains and those of the Black Forest, through which the Rhine flows for above a hundred miles, between Strasburg and Worms, without falling more than two feet in a mile, is in great part covered with alluvium, and is filled to an unknown depth under the soil with sand and gravel similar to that now transported by the Rhone. There is every reason to believe that this valley was at one time the site of a lake far greater than that of Geneva, and probably quite as deep.

The Rhine, in the higher part of its course, is filling up the Lake of Constance, where a considerable tract of alluvial land has been formed; and after issuing pure from the lower end, it appears from the observations of Hammer to have carried on the work of destruction so powerfully in the comparatively short distance between the Lake of Constance and the bottom of the falls at Schaffhausen, as to have supplied materials sufficient to fill up several lakes between Schaffhausen and Strasburg, besides the great lake below Strasburg already spoken of. There are numerous instances of this gradual filling up of lakes, especially in the courses of the greater rivers, as in the Danube between Ulm and Neuburg above Vienna, and most eminently so in the case of the St. Lawrence. Simond states, that the river Linth, in Switzerland, is perpetually filling up its old channel, and overflowing into a new one, in consequence of the mass of rubbish and stones brought down from the Glarus mountains; and that the level of the Lake of Wallerstadt has been actually raised ten feet in the last sixty years by this accumulation. If the river does not meet with lakes in its course, and flows over a great extent of country having a slight degree of inclination, the transported matter very often so accumulates as to raise the bed of the stream itself. One of the most striking instances of this kind is afforded by the Po, the common receptacle of the waters of the numberless torrents which rush down on both sides of it, loaded with spoils from the Alps and Northern Apennines. The effect of this has been that the river has frequently shifted its course; and, to prevent the damage that ensues from such events, the inhabitants of Lombardy have protected their lands by embankments, which confine the river to its channel. This, however, is a work of incessant labour, and deceptive security, for the accumulation of matter in the bed goes on with unremitting constancy; and, to prevent the water from overflowing, the matter must be taken from the bottom and thrown upon the banks, sometimes as much as a foot in a season. The effect of this has been, that in the lower parts of its course the Po runs on the top of a high mound, which even overtops the houses in Ferrara.

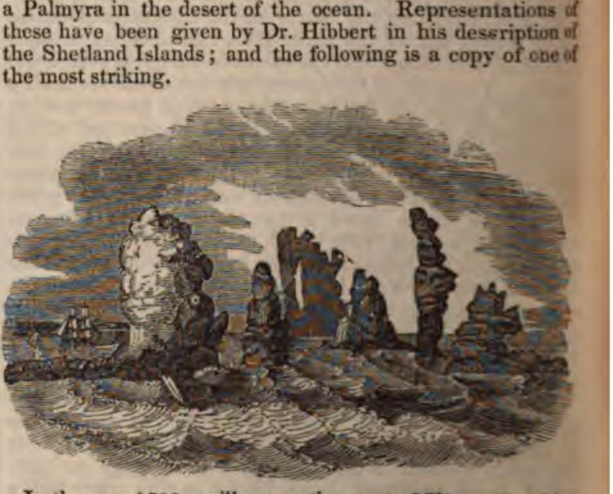
In a mountainous country where the land rises rapidly from the shore, the rivers descending over a steep bed sweep all the contents into the sea. If the neighbouring sea be deep, and the tides be strong, an æstuary or inlet is formed at the mouth of the river—that is, the sea forms a deep indentation into the land, of a triangular shape, forming what Rennell and other geographers have fancifully called a 'negative delta.' If, on the other hand, a low shelving shore, and the absence of strong tidal currents favour the gradual and tranquil deposit of the solid matter brought down by the river, an extensive level of alluvial land is formed. In this case the main river, at a distant point inland, often divides itself into two streams, which, gradually diverging until they reach the sea, inclose a triangular space of land having the form of the fourth letter of the Greek alphabet, Δ, and hence called a *delta*. The mass of water does not, however, long continue divided into two streams only, the process of separation is repeated several times, and thus the delta is traversed by several channels, and the great river empties itself into the sea by many mouths; as may be seen by the inspection of the Nile and Ganges in any map of Egypt or Hindostan on a tolerably large scale. In this way a delta is formed at the mouths of the Rhine, Rhone, Po, Danube, Wolga, Nile, Indus, Ganges, Orinoco, and many others. The magnitude of the delta, generally, although not always, corresponds to the volume of the waters by which it has been created. The head of that of the Rhine is about ninety miles distant from the general line of seacoast of Holland; and although the name of the main river be almost lost by the subdivision of its waters and the junction of other rivers, we include within the Rhine delta the whole of the low land from the neighbourhood of Calais to the north-eastern shores of the Zuyder Zee, which makes the base of the triangle nearly 200 miles. The head of the delta of the Ganges is 220 miles from the sea, its base is 200 miles long, including the space occupied by the two great arms of the Ganges which bound it on either side. The tract in the lower part of this delta, called the Sunderbunds, a wilderness infested by tigers and alligators, is, according to Rennell, equal in extent to the principality of Wales. The whole of a deposit within a delta, as well as much above and on each side of it, is, therefore, an encroachment of the land upon the sea, and in many rivers this growth of the land is in a steady progress of advancement; as, for example, the city of Ravenna, formerly a seaport of the Adriatic, is now four miles inland. There are causes, however, which often prevent the further increase of a delta after it has advanced a certain length: such seems to be the case with the delta of the Nile, which does not advance with the rapidity that might be expected from the quantity of matter brought down by the river. [See NILE.]

Great as is the amount of new land thus formed, it is but insignificant in comparison with the quantity of solid matter carried down by rivers and deposited in the depths of the sea. It is impossible to form any estimate of this upon which reliance can be placed, because no accurate observations have been made to supply the data. To come to anything like a satisfactory conclusion, it would be necessary to have a vertical section of the river at a given point, obtained by numerous soundings, so as to get the profile of the bed, and by observations at different seasons, to get the mean height—we must also have the results of experiments throughout the year, to ascertain the mean velocity, and the volume of solid matter contained in a given bulk of the water. Such experiments conducted with accuracy have not yet been made, as far as we are aware, upon any great river, and in the absence of such information we can do no more than form a conjecture; but the phenomena upon which that is founded show that the annual amount of solid matter carried away from the land must be enormous. The quantity of mud and sand poured by the Ganges into the Bay of Bengal is so great, in the flood season, that the sea recovers its transparency only at the distance of sixty miles from the coast. Mr. Lyell, in his *Principles of Geology*, makes a calculation (founded upon the computations of Major Rennell) as to the mean quantity of water discharged by the Ganges into the sea, by which he shows that supposing the water to contain one hundredth part of solid matter, a mass equal in bulk to the greatest of the Pyramids of Egypt is brought down by the Ganges every day. The sea is discoloured for many leagues from the mouths of the Orinoco, and the solid contents swept by ocean currents through the Gulf of Paria, after being partly deposited on the shores of Guiana and the island of Trinidad, are carried into the Caribbean Sea and Gulf of Mexico. By the observations of Captain Sabine, it appears that the muddy waters of the Amazons river may be distinguished 300 miles from its mouth. The great basin of the Amazons, which is drained by that mightiest of rivers and its vast and countless tributaries, embraces an area, according to Humboldt, only one-sixth less than the whole of Europe, and through this the main stream flows for nearly 3400 miles. The river, at the point where its waters unite with those of the Atlantic, is according to the same illustrious traveller forty miles broad.

If a river loaded with sand encounters a marine current at its mouth, the effect frequently is to throw up a great sand-bank or bar, often to the detriment of the navigation in the adjoining sea, and sometimes to the entire destruction of a harbour. If such sand-banks be thrown up opposite to the delta of a great river, they accelerate its formation, for the matter brought down, in place of being carried far out to sea, is deposited in the intermediate space, and the sand-bank in time becomes united to the delta.

An extensive waste of the land is in constant progress along every line of coast which presents an abrupt face to the sea. The amount and rapidity of that waste depend upon a variety of circumstances; the nature of the rocks of which the cliffs are composed, according as they are capable of long resistance, or are easily acted upon by the weather and the sea; the force of the tides and currents; the greater or less frequency of storms;—all these accelerate or retard the destructive force of the ocean. In this case also, as well as in the action of running water on the land, the force is greatly augmented when the water is charged with solid matter. The violent surge of a tempest dashing against a cliff, detaches large blocks, and sweeps them away; but the next returning wave hurls them back again against the cliff, and thus a powerful artillery is supplied by the land for its own destruction. When we look upon a map of the world, and see the irregular form and indented line of coast of every continent and island, we have before us the most irresistible proof of the powerful force of the waves, and that the line of the shore must have been formed, in a great degree, by the action of the sea. Although this be so evident that no one can entertain any doubt of the fact, a few instances of extensive waste, especially within a comparatively recent period, may put the matter in a clearer point of view to those who are not familiar with such considerations.

The east and south coasts of Great Britain, from the nature of the rocks of which they are composed, and from the violent storms to which they are exposed, are extremely subject to decay. The Shetland and Orkney Islands are laid open to the whole violence of the waves of the Atlantic, and the ocean current runs in the Pentland Frith in ordinary spring-tides, at the rate of ten miles and a half an hour, and about thirteen miles during storms. The steep cliffs on the shores of the Shetland Islands are hollowed out into caves, so that the sea enters in some places to the depth of 250 feet, lofty arches are worn in projecting rocks, and almost every promontory ends in a cluster of pillars, obelisks, and towers, the last fragments of extensive continuous strata. In stormy winters, vast blocks are moved from their seat, overturned, dashed into the sea, or carried considerable distances up acclivities. In this case even rocks of the hardest composition have been unable to withstand the force with which they have been assailed. Islands have been wholly destroyed, and the remains of others rise like the ruins of a Palmyra in the desert of the ocean. Representations of these have been given by Dr. Hibbert in his description of the Shetland Islands; and the following is a copy of one of the most striking.



In the year 1795, a village on the coast of Kincardineshire was swept away by a storm in one night, and the sea penetrated 150 yards inland, where it has maintained its ground ever since. Almost the whole coast of Yorkshire, from the

Tees to the Humber, is in a state of constant decay, especially between Flamborough Head and the Spurn Point; the rate of encroachment at Owthorpe being at present about four yards in a year. An inn at Sherringham, on the Norfolk coast, built in 1805, seventy yards from the sea, in 1829 was separated only by a small garden from the edge of the cliff. There is now a depth of water sufficient to float a frigate at one point in the harbour of that place, where, only half a century ago, there stood a cliff fifty feet high with houses upon it. The whole site of ancient Cromer now forms a part of the German Ocean. Dunwich, once a flourishing and populous town, and the most considerable sea-port on the coast of Suffolk, has been gradually swept away, so that there now only remain about twenty houses. The church of Reculver, on the coast of Kent, was nearly a mile inland in the reign of Henry VIII.; it is now little more than sixty yards from the water's edge.

The whole coast of Sussex has been incessantly encroached upon by the sea from time immemorial; tracts of 400 acres have been carried away at one time, and the old town of Brighton, which stood between the site of the present cliff and the sea in the reign of Elizabeth, has been wholly destroyed. By the undermining of the sea on the coast of Dorsetshire, in 1792, a portion of land 600 yards from E. to W., and a mile and a quarter from N. to S., sunk fifty feet in twenty-four hours. The island of Heligoland, off the entrance of the river Elbe, has been reduced to the fourth part of its size in the last 500 years, and since 1770 has been divided into two parts, the channel between them being navigable by large ships. Nowhere has the sea made greater inroads than on the coast of Schleswig. The island of Nordstrand, in the earlier part of the thirteenth century, was separated from the main land by a narrow stream, was fifty miles long and thirty-five broad, and was populous and highly cultivated. In the year 1240 a great part of it was destroyed, and at the end of the sixteenth century it was reduced to an area of twenty miles in circumference. The industrious inhabitants endeavoured to save their territory by the erection of lofty dikes; but in October, 1634, a great storm devastated the whole island, destroyed 1340 people and 50,000 head of cattle; and three small islets, which have since considerably diminished, were all that remained of the once fertile and populous Nordstrand.

It would be superfluous to give, in this place, farther instances of the like nature: those we have already mentioned have all occurred within the historical æra; others, however, still more remarkable in extent, date from a much earlier period of the earth's history, and the evidence of their occurrence is supplied by the identity in composition of the opposite portions of the separated lands. There is every reason to believe that England once formed a part of France: the cliffs on the opposite sides of the channel are identical at the straits of Dover, and between Folkestone and Boulogne, a submarine chain of hills is, in some places, only fourteen feet below the surface at low water. From the German Ocean to the Straits, the water becomes gradually more shallow, diminishing, in a distance of 200 leagues, from 120 to 18 fathoms; and in the same manner from the Straits to the mouth of the English Channel there is a gradual increase of the depth of the water, so that at the strait there is a ridge with a fall to the west and to the east. In the wearing of the sides, and consequent widening of the straits which is now going on, we see only an advanced stage of a work of destruction which has been many thousand years in operation. That Sicily was at one time united to Italy, was a tradition in the time of Virgil (*Æneid*, III. 414):—

> 'Hæc loca vi quondam et vasta convulsa ruina
> Dissiluisse ferunt, quum protinus utraque tellus
> Una foret: venit medio vi pontus et undis
> Hesperium Siculo latus abscidit.'
>
> ———————' Th' Italian shore
> And fair Sicilian coast were one before
> An earthquake caused the flaw: the roaring tides
> The passage broke that land from land divides;
> And where the land retired, the rushing ocean rides.'
>
> Dryden's *Trans.* v. 529.

All modern observations on the structure of the opposite shores, the bottom of the intervening sea, and the violence with which it is often agitated, give every degree of credibility to the tradition. But as Sicily is in that part so frequently convulsed by volcanic fires, it is very probable that subterranean movements have greatly contributed to the formation of the Straits of Messina. In like manner, there is every reason to believe that the island of Ceylon was at one time united to the continent of Hindostan. [See ADAM'S BRIDGE.] Humboldt is of opinion that the Caribbean was once a mediterranean sea, inclosed by a circuit of land, of which the Caribbee Islands, St. Domingo, Jamaica, and Cuba, are the remains; and the whole form of the land from the promontory of Yucatan, through the above-named islands to Trinidad, and the coast of Cumana, with its deeply indented shores, the numerous islets and shoals, gives countenance to the conjecture, and justifies the belief that we see in the West India islands the monuments of the irresistible force of the waves of the Atlantic, co-operating with subterranean agency, through an indefinite succession of ages.

To what, it may be asked, does all this lead? If such a constant destruction of the land be a part of the system of nature, it necessarily follows that, if her laws continue to endure, the whole of our present continents must in time disappear under the surface of the sea. Undoubtedly to that, and to no other conclusion must we arrive; but such a transference of the land which *now* rises above the surface of the sea is in perfect accordance with what geology tells us has been the economy of nature in times past. All the stratified masses of which the crust of the earth is composed, however high their position may now be, must at one time have been at the bottom of the sea; and the materials of which they are composed must have constituted the component parts of other rocks which, in a former condition of the earth's surface, must have been acted upon and abraded by similar agents. In every great group of strata we find beds composed of large water-worn fragments, materials supplied, most probably, by rivers which had a rapid descent to the sea; but as such water-courses form but a small proportion to those which traverse low and level countries, and carry only the finer particles to the sea, so we find that the beds of conglomerates bear only a small proportion to those strata the materials of which are in a comminuted state,—an additional fact in support of the doctrine, that the formation of strata in past times took place under circumstances analogous to those which are now in progress; that is, that the laws of the material world have continued unaltered. But renovation as well as decay is a part of the economy of nature; and the same subterranean forces which raised our present continents, may, in after ages, repeat the process, and other Alps and other Andes may be produced from the materials which are now washed from our shores, and are accumulating in the unfathomable depths of the ocean. We can in no way conclude these observations so well as by quoting the following eloquent passage from the *Illustrations of the Huttonian Theory*. 'How often these vicissitudes of decay and renovation have been repeated, it is not for us to determine: they constitute a series, of which we neither see the beginning nor the end—a circumstance that accords with what is known concerning other parts of the economy of the world. In the planetary motions, where geometry has carried the eye so far both into the future and the past, we discover no mark either of the commencement or the termination of the present order. It is unreasonable, indeed, to suppose that such marks should anywhere exist. The Author of nature has not given laws to the universe, which, like the institutions of men, carry in themselves the elements of their own destruction. He has not permitted, in his works, any symptom of infancy or of old age, or any sign by which we may estimate either their future or their past duration. He may put an end, as he no doubt gave a beginning, to the present system, at some determinate period; but we may safely conclude that this great *catastrophe* will not be brought about by any of the laws now existing, and that it is not indicated by any thing which we perceive.'

ALMACANTER, an Arabic term, now disused, but which, with many others, was formerly employed in astronomy. The name is given to all the small circles parallel to the horizon; so that two stars which have the same almacanter have the same altitude. Almacanter would now be called a circle of altitude, in the same way as a small circle parallel to the equator, all whose points have therefore the same declination, is called a circle of declination.

ALMADEN, Cisapona Cetobrix of the Romans, a town of Spain in the province of La Mancha, is situated upon a hill of cinnabar, between two mountains which form a part of the chain of Sierra Morena. It belongs to the Archbishopric of Toledo, is fifteen leagues distant from Ciudad-Real, eighteen from Cordova, and forty-four from Madrid.

It comprehends in its district six villages, and has a parish church, an hospital, and barracks for the galley slaves.

Almaden is famed for its mines of quicksilver, which, according to Bowles, are the richest in their produce, the most instructive as to the mode of working them, the most curious for their natural history, and the most ancient in the world. We find them mentioned by Theophrastus, who lived more than 300 years before Christ, and Vitruvius also speaks of them. Pliny places Cisapona, or as it is sometimes written Sisapona, in Bætica, and says that this mine was kept sealed with the greatest care, and was only opened to take the quantity of cinnabar necessary for the consumption of Rome. (*Plin.* xxxiii. 7.) The Romans considered this mineral poisonous, but, notwithstanding this, their matrons painted their faces with it, and their painters employed it as a pigment. The Romans certainly worked this mine, but no traces remain of their labours. The Moors, owing perhaps to some prejudice, did not work them.

The direction of the hill is from north-east to south-west. Bowles says, that he compassed the mine with the watch in his hand, and counted twenty-four minutes in length and fourteen in breadth. The elevation of the hill is 120 feet. It is formed by two inclined planes resembling the back of an ass, and though the elevation appears to be perpendicular, the hill has an inclination of 14°, like all the rocks entering into its formation. Upon the summit of the hill are some naked rocks, on which spots of cinnabar are seen, which, probably, led to the discovery of the mine. Over the rest of the hill some strata of slate with veins of iron are discovered. All this country abounds in iron mines, and what is more surprising, in the same mine of Almaden we find iron, mercury, and sulphur mixed so as to form one mass. The neighbouring hills are formed of the same stone, and on all of them the same species of plants grow, from which we may infer that the mercury does not possess any poisonous qualities, as is generally supposed, injurious to vegetation. Neither do the animals suffer in the least, for a miner sleeps with safety upon a vein of cinnabar. The galley-slaves, who work in these mines, are not exposed to any hardships, as is commonly believed. They only work three hours a day, and do nothing but take out the earth in wheelbarrows. Some feign convulsions and others fits, to excite the compassion of those who visit the mines. The inhabitants of Almaden work willingly double the time, and receive only half of what every slave costs the government.

The stone of these veins is similar to that of the rest of the mountain, and the mineral which it contains is more or less abundant as the grain of the stone is finer or coarser. Every pound of stone gives from three to ten ounces of mercury. Pyrites and quartz, beautifully crusted with cinnabar, are also found. The hornstein is pierced with mineral-like points: finally the pure mercury appears in the crevices of the sandstone and slate.

Two veins, from two to fourteen feet in breadth, cross the hill vertically and meet, or, as the miners express it, kiss each other on the most convex part of it, extending to the breadth of 100 feet, and forming the very rich mine called *Del Rosario*, which gives every year many hundred tons of mercury.

A stratum of limestone, from two to three feet in breadth, traverses the mountain, and serves as a boundary to the mineral. This mine supplied the silver mines of Mexico with mercury, and those of Guancavelica the mines of Peru, but the latter ceased about 1775.

We are indebted to the Spaniards for the mode of separating the silver from the earthy particles by means of mercury, which they have applied to practice since 1566. [See AMALGAM.]

The brothers Mark and Christopher Fuggar, of Germany, undertook to work this mine, and contracted to give the government 4500 quintals (of 100lbs. each) of mercury annually; but not being able to fulfil their promise, they abandoned it in 1635, together with the silver mine of Gualcanal, which they also had. While connected with these mines, however, their riches became proverbial in Spain, and their descendants live at present in Germany with the rank of princes. A branch of this family afterwards took the mine, and worked it until 1645. In the following year the government undertook the management of it. Don Juan Bustamante established the ovens and also troughs for cooling the mineral. These ovens are twelve, and are named by the names of the twelve apostles. Each is capable of containing 10 tons weight of stone. The oven is kept burning for three days, and the same time is required to cool.

There is another mine of cinnabar near Alicante, and another of *mercurio virgen*, (pure mercury,) not far from St. Felipe.

See Bowles's *Introduccion á la Geografia Fisica y á la Historia Natural de España.* Miñano.

ALMAGEST, a name given by the Arabs to the μεγάλη σύνταξις, or *great collection*, the celebrated work of Ptolemy, the astronomer of Alexandria. For a particular description of the contents of this work see the article SYNTAXIS. It was translated into Arabic about the year A.D. 827, under the patronage of the Caliph Al Mamun, by the Jew Alhazen ben Joseph, and the Christian Sergius. The word is the Arabic article *al* prefixed to the Greek word *megistus*, 'greatest,' a name probably derived from the title of the work itself, or, as we may judge from the superlative adjective, partly from the estimation in which it was held.

ALMAGRO (ORETO), a town of Spain in La Mancha, twelve miles from Ciudad-Real, and thirty from Madrid. It is situated in a fertile plain, which produces corn, oil, wine, potatoes, and grass. It is celebrated for its mules, which are considered among the best in Spain, for the sale of which an annual fair is held on the day of St. Bartholomew. About six miles from it springs a fountain of mineral water, of a bitter taste, which it loses if not kept in a glass vessel.

ALMAGRO (DIEGO DE), one of the adventurers who went from Spain to the conquest of America. He was a foundling and brought up by a clergyman of Almagro, according to Gomara; but according to Zarate, of Malagon. When the success of Columbus's voyage became known in Spain, numbers of adventurers, prompted either by religious zeal, or by ambition for military glory, or the desire of gain, flocked to the new world; and many remained in obscurity until an opportunity was offered to them to become known. Of Almagro, nothing is said by the historians previous to the year 1525, when he entered into a sort of partnership with Pizarro and a wealthy clergyman, named Hernando de Luque, at Panamá, to undertake jointly the conquest of Peru. Pizarro took the command of the troops; Almagro engaged to procure the supplies of men, arms, provisions, &c.; and Luque was to remain at Panamá, to forward with the governor of that place, the interests of the company. Pizarro set out first, and Almagro afterwards joined him. Some time after, the execution or murder of the Peruvian Atahualpa, Francisco Pizarro was informed of the arrival of Pedro de Alvarado with some troops to undertake the conquest of Peru, and sent Almagro to them to ascertain their intentions. Almagro met them on the coast, near the present port of Callao. After some negotiation, the greater part of the troops of Alvarado being from Estremadura, and tempted with the offer of 100,000 gold crowns to be divided among them, joined their fellow-countrymen, and marched together to Cuzco.

Almagro was informed by one of this party that he had been appointed governor of *Nueva Toledo.* He interpreted this to mean that Cuzco also was part of his governorship, and assembling the ayuntamiento, openly declared to them his views. The two brothers of Pizarro, Juan and Gonzalo, refused to obey the self-made governor, and were put under arrest. Francisco Pizarro, upon hearing this news, left Truxillo, where he then was, and proceeded to Cuzco in great haste; when Almagro acknowledged his fault, and Pizarro not only pardoned him, but even lent him a considerable sum of money. Pizarro and Almagro entered now into an agreement by which the latter promised upon his solemn oath to leave Cuzco, and never to return within thirty leagues of it, even though the emperor Charles should order him to do so. Upon this he was sent to the conquest of Chili.

In 1535 he set out on his march, in which he crossed the Andes from Cuzco, and traversed the deserts of Atacama to the plains of Chili, a march of 350 leagues. After having suffered much fatigue and privation, he subdued several tribes of Indians; and it is said that he was presented by several caciques with 600,000 ducats in pieces of gold.

Five months after, Juan de Rada and Rui Diaz, whom he had left at Cuzco to recruit men for his army, brought him the intelligence that Fernando Pizarro, whom his brother Francisco had sent to Spain to solicit honours and titles for the discoverers, had returned from thence, bringing the title of Marquis of Peru for Pizarro, Governor of Nueva Toleda for Almagro, and Bishop of Peru for Luque. Some of Almagro's friends advised him to return to Cuzco. On his way thither he met Noguera, an officer who had been sent by Pizarro to ascertain whether he was in want of any assistance to pursue his conquests, Pizarro himself being then employed in building Lima. Almágro availed himself of this opportunity to get full information of the state of affairs at Cuzco, the safety of which, at that time, was much endangered by a revolt of the Indians; and having ascertained that he might easily obtain possession of that city, he immediately proceeded thither. Having subdued the Indians, he entered Cuzco without opposition, imprisoned Gonzalo and Fernando Pizarro, and pillaged their house. Francisco Pizarro, upon hearing of these events, sent from Lima two successive detachments against Almagro, and after having obtained the liberty of his two brothers, joined the army with the rest of his forces, successfully attacked Cuzco, and, having taken Almagro prisoner, caused him to be tried by a court-martial, which condemned him to death for having rebelled against his general, and abandoned his post. This sentence was executed at Cuzco on the 25th April, 1536, Almagro being then in the 75th year of his age.

Almagro is described both by Gomara and Zarate as a brave, liberal, and open character. He never married, but left a son by an Indian woman, who was also called Diego de Almagro, and had as eventful a life and as tragical an end as his father. (See Gomara, *Historia General*, &c., ch. 125—128. Zarate, *Historia de la Conquista del Peru*, book iii. Pizarro, *Varones Ilustres del Nuevo Mundo.*)

AL-MAMUN. [See Abbasides.]

ALMANAC. The derivation of this word has given some trouble to grammarians. The most rational derivation appears to us to be from the two Arabic words *al*, the article, and *mana* or *manah, to count.*

An almanac, in the modern sense of the word, is an annual publication, giving the civil divisions of the year, the moveable and other feasts, and the times of the various astronomical phenomena, including in the latter term not only those which are remarkable, such as the eclipses of the moon or sun, but also those of a more ordinary and useful character, such as the places of the sun, moon and planets, the position of the principal fixed stars, the times of high and low water, and such information relative to the weather as observation has hitherto furnished. The agricultural, political, and statistical information which is usually contained in popular almanacs, though as valuable a part of the work as any, is comparatively of modern date.

It is impossible that any country in which astronomy was at all cultivated could be long without an almanac of some species. Accordingly we find the first astronomers of every age and country employed, either in their construction or improvement. The belief in astrology, which has prevailed throughout the East from time immemorial, rendered almanacs absolutely necessary, as the very foundation of the pretended science consisted in an accurate knowledge of the state of the heavens. With the almanacs, if indeed they had them not before, the above-mentioned absurdities were introduced into the West, and strange to say, it is only within these few years that astrological predictions have not been contained in nine almanacs out of ten. It is not known what were the first almanacs published in Europe. That the Alexandrian Greeks constructed them in or after the time of Ptolemy, appears from an account of Theon, the celebrated commentator upon the Almagest, in a manuscript found by M. Delambre at Paris, in which the method of arranging them is explained, and the proper materials pointed out. It is impossible to suppose that at any period almanacs were uncommon: but in the dearth of books whose names have come down to us, the earliest of which Lalande, an indefatigable bibliographer, could obtain any notice, are those of Solomon Jarchus, published in and about 1150, and of the celebrated Purbach, published 1450—1461. The almanacs of Regiomontanus, said by Bailly, in his *History of Astronomy*, to have been the first ever *published*, but which it might be more correct to say ever *printed*, appeared between 1475 and 1506, since which time we can trace a continued chain of such productions, of which our limits will not allow us to give even the names of the authors. They may be found in the *Bibliographie Astronomique* of Lalande, and in Hutton's *Mathematical Dictionary*, article Ephemeris. The almanacs of Regiomontanus, which simply contained the eclipses and the places of the planets, were sold, it is said, for ten crowns of gold. An almanac for 1442, in manuscript we presume, is preserved in the *Bibliothèqae du Roi* at Paris. The almanacs of Engel of Vienna were published from 1494 to 1500; and those of Bernard de Granolachs of Barcelona, from about 1487. There are various manuscript almanacs of the fourteenth century in the libraries of the British Museum, and of Corpus Christi College, Cambridge.

The first astronomical almanacs published in France were those of Duret de Montbrison, in 1637, which series continued till 1700. But there must have been previous publications of some similar description; for, in 1579, an ordonnance of Henry III. forbade all makers of almanacs to prophesy, directly or indirectly, concerning the affairs either of the state or of individuals. In England, the royal authority was less rationally employed. James I. granted a monopoly of the trade in almanacs to the Universities and the Stationers' Company, and under their patronage astrology flourished till beyond the middle of the last century, but not altogether unopposed; the humorous attack of Swift, under the name of Bickerstaff, upon Partridge's almanac, is well known, both from the amusement which the public derived from the controversy, and the perpetuation of the assumed surname in the *Tatler*. But though Swift stopped the mouth of Partridge, he could not destroy the corporation under whose direction the almanac was published. The Stationers' Company (for it is but fair to state that the Universities were only passive, having accepted an annuity from their colleagues, and resigned any active exercise of their privilege) found another Partridge, as good a prophet as his predecessor: nor have we been without one to this day.

The Stationers' Company appears to have acted from a simple desire to give people that which would sell, whether astrological or not; and not from any peculiar turn for prophecy, inherent in the corporation. Thus even in 1624 they issued at the same time the usual predictions in one almanac, and undisguised contempt of them in another: apparently to suit all tastes. The almanac of Allstree, published in the above-mentioned year, calls the supposed influence of the moon upon different members of the body 'heathenish': and dissuades from astrology in the following lines, which make up in sense for their want of elegance and rhythm:

> 'Let every philomathy (*i.e.* mathematician.)
> Leave lying Astrology,
> And write true Astronomy,
> And Ile beare you company.'

In 1775, a blow was struck which demolished the *legal* monopoly. One Thomas Carnan, a bookseller, whose name deserves honourable remembrance, had some years before detected or presumed the illegality of the exclusive right, and invaded it accordingly. The cause came before the Court of Common Pleas in the year above-mentioned, and was there decided against the Company. Lord North, in 1779, brought a bill into the House of Commons to renew and legalize the privilege, but, after an able argument by Erskine in favour of the public, the House rejected the ministerial project by a majority of 45. The absurdity and even indecency of some of these productions was fully exposed by Erskine; but the defeated monopolists managed to regain the exclusive market, by purchasing the works of their competitors. The astrological and other predictions still continued; but it is some extenuation that the public, long used to predictions of the deaths of princes and falls of rain, refused to receive any almanacs which did not contain their favourite absurdities. It is said (Baily, *Further remarks on the defective state of the Nautical Almanac*, &c., p. 9) that the Stationers' Company once tried the experiment of partially reconciling Francis Moore and common-sense, by no greater step than omitting the column of the moon's influence on the parts of the human body, and that most of the copies were returned upon their hands. For more detail upon the contents of former almanacs, see the *Companion to the Almanac* for 1829, and also the *London Magazine* of December, 1828, and *Journal of Education*, No. V.

The *British Almanac* was published by the Society for the Diffusion of Useful Knowledge in 1828. Its success induced the Stationers' Company to believe that the public would no longer refuse a good almanac because it only predicted purely astronomical phenomena, and they accordingly published the *Englishman's Almanac*, which is unexceptionable. We may also add that the other almanacs are diminishing the quantity and tone of their objectionable parts, so that before long it may be hoped that the latter will disappear entirely.

Of the professedly astronomical almanacs the most important in England is the *Nautical Almanac*, published by the Admiralty for the use both of astronomers and seamen. This work was projected by Dr. Maskelyne, then Astronomer Royal, and first appeared in 1767. The employment of lunar distances in finding the longitude, of the efficacy of which method Maskelyne had satisfied himself in a voyage to St. Helena, required new tables, which should give the distances of the moon from the sun and principal fixed stars, for intervals of a few hours at most. By the zeal of Dr. Maskelyne, aided by the government, the project was carried into effect, and it continued under his superintendence for forty-eight years. During this time it received the highest encomiums from all foreign authorities, for which see the French *Encyclopædia*, art. ALMANACH, and the Histories of Montucla and Delambre. From 1774 to 1789 the French *Connoissance des Tems* borrowed its lunar distances from the English almanac. On the death of Maskelyne it did not continue to improve, and, without absolutely falling off, was inadequate to the wants either of seamen or astronomers. From the year 1820, various complaints were made of it in print. It was latterly stated that officers employed in surveys were obliged to have recourse to foreign almanacs for what could not be obtained in their own; that Berlin, Coimbra and even Milan were better provided with the helps of navigation; and finally that the calculations were not made from the best and most improved tables. In consequence of these complaints, which were almost universally allowed by astronomers to contain a great deal of truth, the government, in 1830, requested the opinion of the Astronomical Society upon the subject, and the Report of the Committee appointed by that body, which may be found in the fourth volume of their *Transactions*, is a sufficient proof of the opinion of practical astronomers on the previous state of the work. The alterations proposed by the society were entirely adopted by the government, and the first almanac containing them, viz., that for 1834, has just appeared. The contents of the old Nautical Almanac may be found in the *Companion to the Almanac* for 1829. We subjoin a list of the principal alterations and additions which appear in the new work:—

1. The substitution of *mean* for *apparent* time throughout, the sun's right ascension and declination being given for both mean and apparent noon.
2. The addition of the mean time of transit of the first point of Aries, or the beginning of the sidereal day.
3. The moon's right ascension and declination given for every hour, instead of every twelve hours. We must mention, however, that the intervals of twelve hours were diminished to three hours in the *Nautical Almanac* for 1833, by Mr. Pond the Astronomer Royal.
4. The distances of the moon from the planets for every three hours.
5. The time of contact of Jupiter's satellites and their shadows with the planet.
6. Logarithms of the quantities which vary from day to day, used in the reduction of the fixed stars.
7. Lists of stars which come on the meridian nearly with the moon; of occultations of the planets and stars by the moon, visible at Greenwich.
8. The places of the old planets for *every* day at noon instead of every tenth day; and those of the four small planets for every fourth day, which were previously not mentioned at all.
9. The 60 stars, whose places were given for every ten days, are increased to 100.
10. The number of lunar distances given is very much increased.

Besides these principal alterations, there is a large number of minor additions, tending for the most part to save labour in calculation; and the extent to which the results have been carried is materially enlarged. We mention, in order to diffuse a knowledge of the fact, that any *errata* discovered in any mathematical tables which are generally or even occasionally of use, will be published in the *Nautical Almanac*, if communicated by the finder.

It should also be noticed that the *Supplements* which it has been customary to publish during the last few years are now discontinued. It is intended to bring out the *Nautical Almanac* four years in advance, but, at present, (July, 1833,) owing to the time which it has taken to consider and arrange the alterations, the Almanac for 1834 has only just appeared.

This country has been forestalled in most of the important changes just mentioned, by the Berlin *Ephemeris*, published under the superintendence of Professor Encke. Its predecessor, the *Astronomisches Jahrbuch*, was conducted for fifty years by the celebrated Bode; and was entirely remodelled by Encke in 1830. Of other works of the same kind, published on the continent, those of Coimbra and Milan are among the most valuable; the latter was commenced in 1755, by M. de Cæsaris; we have not been able to learn the date of the first establishment of the former.

The oldest national astronomical almanac is the French *Connoissance des Tems*, published at present under the superintendence of the *Bureau des Longitudes* at Paris. It was commenced in 1679 by Picard, and continued by him till 1684. It then passed through the hands of various astronomers, till 1760, when the conduct of it was given to Lalande, who, besides other alterations, first introduced the lunar distances, which have been already alluded to. At present the plan is very similar to that of the new *Nautical Almanac*, with the addition of very valuable original memoirs which appear yearly. In fact we may say generally, that the original contributions to the various continental almanacs are among their most valuable parts; and as Professor Airy remarks, *Reports of the British Association*, &c., p. 128, 'In fact nearly all the astronomy of the present century is to be found in these works,' that is, in certain periodicals which are mentioned, 'or in the *Ephemerides* of Berlin, Paris, or Milan.'

Next to the *Nautical Almanac*, the private publication which is most entitled to notice as an astronomical almanac is White's *Ephemeris*, a work which is nearly as old as the monopoly previously described. For many years past, this publication has given astronomical data sufficient to enable the seaman to find his latitude and time. The *Gentleman's Diary*, commenced in 1741, and the *Ladies' Diary*, in 1705, have powerfully aided in keeping up a mathematical taste, to a certain extent, throughout the country, by annually proposing problems for competition: several, who have afterwards become celebrated in mathematics, have commenced their career by the solution of these problems.

At present, all almanacs published in this country are subjected to a heavy stamp duty of fifteen-pence per copy. The average number of stamps issued for this purpose between the years 1821 and 1830 inclusive, was about 499,000, producing an average revenue of about 31,000*l*. When almanacs were almost wholly devoted to purposes of imposture, the heavy duty might be defended upon the ground that it obstructed the diffusion of a pernicious commodity, and was, in truth, only a lawful spoiling of the monopolists. At the present time the tax prevents the free competition of respectable publishers in almanacs; and further, is so enormous, that many individuals are tempted to evade the law, and unstamped almanacs are circulated in as large numbers as those which pay the tax. We are enabled to state this, without hesitation, upon the authority of information which we have collected from every part of the United Kingdom. We may well smile at a tax which promotes fraud both among those who obey and disobey the law: that is, astrology among the honest, and smuggling among the unprincipled.

ALMANSOR, properly AL-MANSUR; or, with his complete name, ABU JAFAR ABDALLAH AL-MANSUR, the second caliph of the Abbaside dynasty, [see ABBASIDES,] was born at Homaima in Syria, A.D. 713. During the short reign of his brother and predecessor Al-Saffah, he had been governor of Mesopotamia, Armenia, and Azerbijan. When Al-Saffah died, A.D. 753, Al-Mansur, who was then on a pilgrimage to Mecca, was called to the throne. At the very beginning of his reign, Al-Mansur had to encounter an opponent in the person of his cousin Abdallah, who claimed the caliphat. After a hard struggle, the forces collected by Abdallah were defeated by Abu Moslem, a commander who had already under Al-Saffah given signal proofs of his adherence to the cause of the Abbasides. At that time Abu Moslem was governor of the province of Khorasan, where he enjoyed much popularity. Al-Mansur now appointed him prefect of Syria and Egypt, and on Abu Moslem's refusal to accede to this arrangement, Al-Mansur became so incensed against him that he summoned him to Madaïn, where he was murdered in the presence of the caliph. Abdallah, who had retired into Irak, was afterwards taken and killed.

In 754 Sinan, of Nishapur, revolted in Khorasan. The caliph sent an army under the command of Jamhur against him, who soon suppressed the tumult. But when the caliph somewhat unceremoniously called on him to send home the booty that he had made during this expedition, Jamhur himself revolted, and occupied Ispahan. He was, however, soon obliged to retire into Azerbijan, where he was ultimately defeated, A.D. 755.

The year 758 was marked by a disturbance of a peculiar kind at Kufa. The Ravendites, a tribe of Khorasan, the descendants of Abdallah ben Ravend, who believed in a sort of metempsychosis, had from the beginning been in favour of the Abbaside family, but a dispute had arisen between them and Abu Moslem, in consequence of which they were obliged to keep themselves concealed during his lifetime. Now, after Abu Moslem's death, they came in considerable numbers to the court, where they mixed up harangues about their dogmas with absurd flattery of the caliph. The caliph being disgusted by their proceedings, imprisoned about 200 of these enthusiasts. This measure gave great offence to the whole party: they liberated their comrades by force, and raised a tumult at Kufa, which could only be repressed by much energy on the part of the caliph. It is said that in consequence of this disturbance, Al-Mansur took a dislike to his residence at Kufa, and laid the foundation of the town of Bagdad, which became from this time the abode of the caliphs.

In the year 762, an unsuccessful attempt to overthrow the dominion of the Abbasides, was made at Medina by Mohammed, a descendant of Hossain, the son of Ali ben Abi Taleb. Mohammed was soon vanquished by Isa ben Musa, whom the caliph had sent against him. But Mohammed's brother, Ibrahim, excited disturbances of a more serious nature at Basra. The governor of that town was compelled to surrender the fort and treasury to the insurgents, who soon made themselves masters also of the towns of Ahwaz and Wasit. Ibrahim was actually marching against Kufa, when he was met by Isa ben Musa, who defeated him in a sanguinary battle near a place called Ahmaza. Ibrahim lost his life in the engagement, 18th of February, 763.

Al-Mansur died, September, 775, at Bir Maimuna, on a pilgrimage to Mecca: his son Al-Mahdi succeeded him in the caliphat. Al-Mansur first showed that predilection for literature, which for several centuries became a distinguishing feature in the character of the Mohammedan sovereigns. During his reign translations were commenced of the works of antient Greek writers on metaphysics, mathematics, astronomy, and medicine into Arabic. The Arabs were thus made familiar with the works of Aristotle, Euclid, Ptolemy, and Hippocrates, and had the opportunity of reading, in their own language, several Greek authors of which the originals are now lost.

ALME, or AL-MAI, *i. e.* 'the learned,' the name given by the modern Egyptians and Arabs to the dancing and singing girls of Egypt. The word *alma* seems to be corrupted from the Arabic *âlimah*, the feminine form of the active participle *âlim, sciens, sapiens.* They form a particular class or society, living together in bands, who are distributed in the various towns, or travel about the country in quest of employment. They are present at all festivals and marriages, and other ceremonies. The girls who are admitted into this society have generally a fine voice; they learn by heart the best songs on romance and love; and some are also able to sing extempore verses, after the manner of the Italian *improvisatori.* But they chiefly excel in pantomimic dances, which represent the various incidents of life, and above all, the passion of love. The suppleness of their bodies is very great, as well as the flexibility and expression of their features; but the indecency of their attitudes is excessive. 'When they begin to dance, they wear a long and very light silk robe floating to the ground, negligently girded by a sash; their long black hair, perfumed and in tresses, descends over their shoulders; the shift, transparent as gauze, scarcely conceals the skin: as the action proceeds, the various forms and contours the body can assume seem progressive; the sound of the flute, the castanet, the tambour, and cymbals, regulate, increase, or slacken their steps. Words, adapted to such scenes, inflame them more, till they appear as if intoxicated, and become frantic bacchanals. Forgetting all reserve, they then abandon themselves to the disorder of their senses, while the indelicate and licentious spectators, who wish nothing to be left to the imagination, redouble their applause.' (Savary's *Letters on Egypt.*) These Almai are admitted into the harems of the great, where they instruct the women in dancing and singing, or amuse them by reciting poems. They excel in singing pathetic ballads: dwelling upon plaintive tones, they inspire a feeling of melancholy which, insensibly increasing, draws tears from the eyes. The Turks, enemies as they are to the arts, pass whole nights in listening to them. Two girls sometimes sing together, but, like their orchestra, they are always in unison: accompaniments in music are only for enlightened nations; on the contrary, people whose feelings are oftener appealed to than their understandings, delight in simple sounds which immediately affect the heart, without engrossing their minds by the modulations of a well-supported harmony.

The Almai also accompany funerals, at which they sing dirges, and utter groans and lamentations, like the *præficæ* of Sardinia, Corsica, and other European countries. The higher and more accomplished class of the Almai attend none but wealthy people, and their price is high. The common people, however, have also their Almai, who try to imitate the superior class, but have neither their elegance, grace, nor knowledge. They are seen everywhere; the public squares and the walks round Cairo abound with them. Their morals are as licentious as their songs; they are, in fact, the common courtezans of the country. Although there are Almai in Syria and other parts of the Ottoman empire, yet Egypt seems to have been at all times their favourite, and as it were, their native country. The Bayaders of India are a sort of Almai.

ALMEIDA, a strongly-fortified city of Portugal, in the province of Beira, and *comarca* of Pinhel: $40^\circ 37'$ N. lat. $6^\circ 52'$ W. long. Population 1150. It lies between the rivers Coa and Turones, both tributaries of the Douro, and the latter forming the boundary between the kingdoms of Spain and Portugal. Its position, therefore, on the frontier, has always made it a post of great military importance, the more so as it is in some measure opposed to the Spanish fortress of Ciudad Rodrigo, from which it is less than thirty miles distant. In the peninsular war, Almeida was more than once an object of contention. In the month of August, 1810, it was invested by Massena, and the English governor, Colonel Cox, with his Portuguese garrison was prepared for a determined resistance, but, on the evening of the 26th, only eight days after the trenches were opened, the magazines, either through accident or treachery, exploded. The whole town was consequently in ruins, the batteries breached, and the greater part of the guns thrown into the ditch. Still the governor refused the terms of Massena, when some of the Portuguese officers, who were in treasonable communication with the French, headed a mutiny of the garrison and compelled him to surrender. In the following spring Massena again retreated within the Spanish frontier, and was unable to throw supplies into Almeida to prepare it for a siege. When the British commenced the blockade, he made an unsuccessful attempt to relieve it by the battle of Fuentes de Oñoro, but succeeded in sending orders through the British posts of blockade for the French governor, General Brennier, to abandon the fortress. This order was executed with great skill and success. After destroying the ramparts and guns, without exciting any suspicion on the part of the British, Brennier sprung his mines at midnight on the 10th of May, and made his way with 1500 men through the British troops without much loss. On the banks of the Agueda he joined one of the main divisions of the French army. (Miñano. Napier's *Peninsular War.*)

ALMEIDA, FRANCISCO, seventh son of the Conde de Abrantes, was the first Portuguese viceroy of India. In his youth he distinguished himself against the Moors in the Peninsula, particularly in the conquest of Granada. In 1505, while paying a visit to his brother, the Bishop of Coimbra, he was sent for by King Manoel, or Emanuel, and intrusted with the important office of viceroy of the recently acquired possessions in India. On the 25th of March, 1505, he set sail from Lisbon. His embarkation, says Barros, was the most brilliant that had ever taken place in Portugal. His force consisted of 1500 men, all belonging to very respectable families; many of them were noblemen of the king's household, all anxious to serve under so distinguished a leader.

After a prosperous voyage Almeida arrived at Quiloa, on the 22nd of July. The Moorish king of that city Habraemo, or Ibrahim, was not friendly to the Portuguese. Almeida complained to him of his not having paid due respect to the Portuguese flag, when Ibrahim apologized for his fault, and promised to visit the viceroy on the morrow. But instead of the king, a messenger from him came to make a fresh apology for not having fulfilled his promise, on account of a black cat having passed before him as he was coming, which circumstance he considered as a very bad omen. Almeida told the messenger to inform his master, that he himself would pay him a visit at his own house. At the approach of the Portuguese, Ibrahim fled, and Almeida gave the crown of Quiloa to Mohammed Anconi, a worthy man, and a great friend of the Portuguese. Almeida received the homage of the new king in the name of his master, built a fortress to keep the inhabitants in subjection, and then proceeded to the town of Mombaza, which he destroyed. On his arrival at Cananor on the Malabar coast he received an embassy from the King of Bisnagar, who was desirous to form an alliance with the Portuguese. Almeida erected here another fortress to protect the factories, or commercial establishments of Cananor, Cochin, and Coulan, and loaded eight vessels with spicery, which he sent to Portugal. This squadron in its way to Europe discovered the island of Madagascar.

The governor of Cochin, Trimumpara, had resigned in favour of one of his relations, and the viceroy went to that town with the object of renewing the alliance with the new king. Almeida sent his son Lorenzo against the King of Calicut, who had offered some injuries to the Portuguese merchants. Lorenzo, after having taken ample satisfaction for the insult, went to make an establishment at Ceylon, and also took the Maldive islands. At the same time, four vessels, which had come from Portugal, formed a commercial alliance with the King of Malacca, and established two factories in the island of Sumatra.

The soldan, or caliph of Egypt, with the aid of the republic of Venice, which always looked with an envious eye on the success of the Portuguese, had fitted out a naval expedition, and given the command of it to an experienced Persian, named Mir Hocem. The King of Calicut, expecting this assistance, made preparations for war, upon which the viceroy sent his son against him. When Lorenzo was in the port of Chaul, the Egyptian fleet, which had been reinforced with twenty-four vessels of the governor of Diu, appeared. Lorenzo at first mistook them for the squadron of Albuquerque, which he was expecting. The fire of Mir Hocem, however, soon made him discover his error. The two squadrons fought till night-fall without any considerable advantage on either side. Some of his officers advised Lorenzo to avail himself of the obscurity of night in order to cross the bar, and get out into the sea; but the gallant young man, though severely wounded, said, that to go away at night was nothing else than to run away, and that was a thing which he never would do. As the Portuguese squadron was sailing out in the morning, the Egyptians opened a brisk fire upon it. Lorenzo's vessel was the last, and the enemy directed their principal fire against her. At last she was separated from the rest of the vessels in a very sandy and rocky place. As the tide was running out with great rapidity, the other vessels could not render her any assistance, and the enemy showered their fire upon her with a sure aim. Lorenzo was requested by his men to save himself in the boat, but he would not consent to abandon them. A shot carried off one of his legs. He caused himself to be tied to the mast, where he continued to animate his men until another shot carried off the left side of his chest. The galley was by this time upon a sandbank; it was boarded without difficulty, and twenty-four men, who remained in it, were carried away captives. The rest of the vessels proceeded to Cananor, and informed Almeida of the disaster. He bore it with fortitude, and was making preparations to revenge his loss, when Alfonso de Albuquerque, who was appointed governor of India in his place, arrived. Almeida received him very coolly, and a quarrel ensuing, Albuquerque was sent to Cochin, where he was kept three months under arrest. [See ALBUQUERQUE.]

Almeida, whose only object now was to gratify his vengeance, sailed to Onor, where he burnt some vessels of the King of Calicut, entered the port of Dabal, or Dabul, belonging to the King of Goa, on the 13th of December, 1508, took the town, and after having plundered it reduced it to ashes. He then went in search of the Egyptian fleet, and found it near Diu in the kingdom of Cambay, and obtained a complete victory over it. Mir Hocem, with only twenty-four men, escaped; eight of his vessels were taken, and the rest sunk.

Almeida, having thus punished his enemies, returned to Cochin, where Marshal Coutinho, who had arrived from Portugal, urged him to return home. The viceroy released Albuquerque, surrendered his government, and sailed from Cochin on the 13th of November, 1503. On his way to Portugal, after having doubled the Cape of Good Hope, he stopped at Saldanha bay to procure a supply of fresh water. His soldiers had a dispute with the natives, and an affray ensued. One of his officers, Mello, seeing the venerable old man alone in the midst of that inhospitable country, observed to him in a sarcastic manner, 'Here I should wish to see by your side one of those whom you favoured in India.' Almeida very composedly answered, 'This is not the time to think of that; think rather how to save the royal standard; as for me, I am old enough, both in years, and in sins, to die here, if that be the will of the Lord.' From this moment Mello never abandoned either the standard or his general, until Almeida fell pierced by a lance.

'That the man who had trampled over countless thousands of the Asiatics,' says a contemporary writer; 'who had humbled their sovereign princes, and annihilated in the seas the powers of the Egyptian Soldan, should perish on an obscure strand, by the hands of a few savages, should be a salutary lesson for human ambition.'

Almeida was a man of noble appearance, prudent, courteous, and very much esteemed for his generosity. During his administration of India, he made the Portuguese name respected. He is represented by some writers as a conceited man, who thought nobody so well qualified to govern India as himself; but, perhaps, we only do him justice in believing that his ruling motive was a desire to elevate the fame and power of his native state. (See Barros, *History of the Portuguese Conquests in the East*, decade i., book 8 to the end—ii., book 1—4; Damian á Goes, *Chronica do Senhor Rey Dom Manoel;* Mariana, book xxix. chap. 16.; Lardner's *Cabinet Cyclopædia, History of Spain and Portugal*, vol. iii. p. 306.)

ALMERIA, a modern province of Spain formed out of the eastern part of the kingdom of GRANADA.

ALMERIA, the antient Murgis, the capital of the province is near the outlet of the river Almeria, 36° 51′ N. lat., 2° 33′ W. long. It has a convenient well-sheltered port, and some manufactures of saltpetre, soda, and cordage made of Spanish broom. During the time of the Moorish kings of Granada, it was one of the most opulent commercial towns in their dominions. Cotton is now cultivated to some extent along the coast of Granada, about Motril, and as far as Almeria. The culture was introduced by Mr. Kirkpatrick, while acting as consul for the United States of America at Malaga, in the beginning of the present century.

ALMOHADES, the name of a Mohammedan dynasty, which began in Africa and Spain with Abdelmumen, in the year 542 of the Hegira, A. D. 1147. Mohammed ben Abdallah, a native of Herga, in Africa, was the son of a lamplighter in a mosque. He received his education at Cordova; and having finished his studies, he travelled to the east to improve his knowledge, and visited Cairo and Bagdad. In Bagdad he attended the school of the philosopher Abu Hamid Algezali, who had written a book on the revival of learning and of the law, which was condemned at Cordova as dangerous to the faith of Islam. Ali, the Almoravidian king of Cordova, approved of this decision, and the book was given up to the flames. Algezali perceiving a stranger in his school, and having ascertained that he was from the west, asked him, whether he had ever been at Cordova, and heard of his book. Abdallah informed him of the fate of his work. The doctor turned pale, tore the book which he had in his hands, and, looking to heaven, exclaimed, 'May God thus tear the kingdom from the impious Ali!' Abdallah joined him in his prayer, and added, 'Pray God to make me an instrument of thy vengeance.'

After three years' residence at Bagdad, Mohammed returned to Mauritania in 510, (A.D. 1116,) where he rendered himself conspicuous by the simplicity of his dress, by his austerity, and by his bold preaching against the vices both of the king and the people. On his arriving at a village called Tejewa, he met a youth of prepossessing appearance, by name Abdelmumen, who was going with his uncle to study in the east. Abdallah promised to give him the instruction which he desired, but taught him all that was most conducive to his own designs. He communicated to him a prophecy in which it was foretold, that the empire of life and of the law would only arise with Abdelmumen. Having thus prepared him, he named him his vizier. They both went to Fez, and thence to Marocco. Entering one day into the mosque of the latter city, Mohammed placed himself in the seat of the Imam. One of the ministers represented to him, that nobody could occupy that place except the king of the faithful. Mohammed answered him with much gravity in these words of the Koran, '*Inna'l-mesajida lillahi*;' 'certainly the temples only belong to God.' Shortly after the king entered, and prayers being said, Mohammed arose, and addressing himself to Ali, said to him, 'Put a remedy to the evils and injustices prevailing in thy kingdom, for God will require of thee an account of thy people.' The king, at first, treated him with contempt; but as he continued to preach and attract the multitude, Ali at last assembled his council; and though severe measures were proposed, the king contented himself with expelling him from the city.

Mohammed now built a hut in a burial-ground, and multitudes flocked there to hear his doctrine. He preached to them about the coming of the great Mehedi, who was to establish the empire of justice upon earth. The king ordered him to be imprisoned and beheaded, but he escaped to Agmat, and thence to Tinmāl in the land of Sous. One day while he was expounding the prophecy of the coming of the great Mehedi, Abdelmumen observed, 'That prophecy evidently applies to thee; thou art the true Mehedi.' Upon this, Abdelmumen, with fifty others of his disciples, acknowledged him as their Mehedi. After these, seventy more swore allegiance to him. Mohammed established two councils. The fifty who first acknowledged his authority were those with whom he entrusted the affairs of greater consequence, and to the latter seventy he confided those of less importance.

He then went to the mountains, preaching the unity of God, and was followed by 20,000 men of the tribe of Masamuda, to whom he gave the name of *Mowahedun*, that is, Unitarians, from which the name of Almohades is derived. The command of this army was given to Mohammed Alakhir.

Abu Is'hac Ibrahim, Ali's own brother, marched against the rebels; and the two armies were ready to fight, when a sudden terror seized the foremost ranks of Ibrahim, who, turning their horses, began to fly in all directions, trampling down their own fellow-soldiers. The Almohades possessed themselves of the rich baggage, and in consequence of this success several other tribes joined them. Ali now called his brother Temin from Spain, and with a powerful army sent him against the Mehedi, who had retired to the mountains. This general, though more successful than the preceding, never could defeat the Almohades. They fortified themselves at Tinmāl, and from this place they sallied forth to devastate the surrounding country.

In 1125 A.D., 513 of the Hegira, they laid siege to Marocco, but were defeated in a vigorous sally made by the besieged. Three years afterwards Abdelmumen marched at the head of 30,000 men, and obtained a complete victory over the Almoravides. On his return to Tinmāl, the Mehedi came out to greet the victorious general; and the next day he called his men at the mosque, and took his last leave of them. Shortly after Abdelmumen waited upon him. The Mehedi gave him the book of Algezali, and departed from this world. He had made several reforms in the Mohammedan religion, among which was the adoption of a more simple profession of faith, and of prayers which they were allowed to say on their march and even when fighting, which gave them a superiority over their enemies.

The chiefs of the Almohades now assembled to determine the form of government they should adopt after the death of the Mehedi; and having decided in favour of a moderate monarchy, the election fell upon Abdelmumen, who was declared Imam and Amir-al-Mumenin. He pursued his conquests with vigour, and in three years reduced the empire of the Almoravides to very narrow limits. He took Oran and Fez, and laid siege to Marocco, the only city now left to the Almoravides in Africa. Whilst Abdelmumen was engaged in reducing that city, he sent Abu Amran with a numerous army to invade Andalusia. Many of the petty chiefs of Spain joined the Almohades. In the mean time the siege of Marocco was pursued with vigour, and the inhabitants defended it heroically. The besieger swore he would not retire until he had sifted the town through a sieve. Famine had carried off three-fourths of the population, and the remaining part could make but a feeble defence, when the city was taken by a general assault in the year 543 of the Hegira, A.D. 1148. The young emperor Ibrahim was put to death, the few surviving inhabitants inhumanly massacred, and the town demolished. According to Marmol, Abdelmumen literally fulfilled his oath. He afterwards rebuilt the city, and called some tribes from the desert to re-people it.

The arms of the Almohades were not less successful in Spain than in Africa. Almost all Andalusia acknowledged their dominion. Cordova, the last hold of the Almoravides, was taken by Abu Amran, and Abdelmumen was proclaimed sovereign both of Mauritania and Spain.

Not content with the territory he possessed in Spain, Abdelmumen published, in 557, (A.D. 1161,) the *jihád*, or holy war, with an intention of subduing the whole of the Peninsula. He levied an army of 100,000 horse and 300,000 foot, but in the midst of his preparations death overtook him, in 558.

His youngest son, Yussef Abu Yacub, succeeded him. This prince, not being so warlike as his father, dismissed the army, which he had assembled at Sulé, and in the first few years of his reign he cultivated the arts of peace. In 566, (A.D. 1170,) however, he invaded Spain, and, after conquering the rest of the Mohammedan dominions in the Peninsula, fell in an engagement with the Christians.

Yussef ben Yacub, better known by the name of Almansor, landed at Algeciras, and defeated Alonso III. of Castile in the plains of Alarcos. The prisoners he had made in this battle he immediately restored to liberty—an example of very rare occurrence among the Mohammedans. After this signal victory he took Calatrava, Guadalajara, Madrid, and Salamanca, and afterwards returned to Africa, where he died in 595, (A.D. 1198.) This prince was the ornament of his age, and the most liberal and magnanimous of the Almohadian dynasty.

His son Mohammed Abu Abdalla, who succeeded him, though an effeminate and weak prince, was not insensible to the glory of arms. He mustered a most powerful army, one of the five divisions of which, if we are to give credit to the Arabic and Spanish historians, amounted to 160,000 men: his design was to conquer the whole Peninsula. Such was the terror which this vast armament inspired among the Christians, that Innocent III. proclaimed a crusade, and several bishops went from town to town to rouse the Christian princes. The kings of Castile, Aragon, and Navarre, with a numerous body of foreign volunteers, advanced to stop the progress of the Moslems. The two armies met in Las Navas de Tolosa, between Castile and Andalusia; and on the 12th of June, 1211, the Christians obtained so complete a victory over the Africans, that Mohammed himself had a narrow escape, and left no less than 170,000 men on the field; the rest fled for safety. After this signal defeat he retired to Marocco, gave up the care of the government to his son, Yussef Abu Yacub, who was only eleven years of age, and passed the last days of his life in licentious pleasures. He died in 610, (A.D. 1213.)

Abu Yacub died without issue in 620, (1223.) His death was the signal of a civil war which ended with the destruction of the Almohades. After several disputes Almamun Abu Ali, brother of the governor of Valencia, was proclaimed emperor. He projected a reform in the constitution, and prepared the way towards it by writing a treatise against the institutions of the Mehedi. The two councils instituted by the Mehedi, against whom Almamun's reform was principally directed, deposed him, and chose Yahya ben Anasir in his stead, supplying him with troops to oppose Almamun. Yahya landed in Andalusia, and was defeated by the emperor near Medina Sidonia. Almamun speedily crossed over to Africa, and arriving at Marocco unexpectedly, assembled the senate, and after upbraiding them for their conduct, caused them to be beheaded in the court of the palace. All the walis suspected of partiality for this body, underwent the same fate, and their heads were left to putrefy on the ramparts of Marocco.

In Spain, Ibn Hud, an Andalusian sheik, who had formed the project of rescuing the country from the yoke of the Almohades, after a series of victories expelled them from the Peninsula. Almamun, harassed by so many disasters, died in 629, (1231.) His successors in Africa lived in a continual state of intestine warfare. The last of them was Idris, who fell in a battle against the Marini, and with him ended the dynasty of the Almohades. (See Casiri's *Bibliotheca Arabico-Hispana;* Conde, *Historia de la Dominacion de los Arabes en España,* vol. ii. ch. 26-58.; Marmol's *Descripcion General de Africa;* Rodericus Toletanus, *de Rebus Hispanicis;* D'Herbelot, *Bibliothèque Orientale.*)

ALMOND. [See AMYGDALUS.]

ALMONDBURY, an extensive parish in the North Riding of Yorkshire, containing, in 1831, 30,606 inhabitants, and comprehending several townships: the principal township, of the same name with the parish, which contains 7086 inhabitants, is within two miles of Huddersfield. The original parish church is at Almondbury, (the living, a vicarage, is in the gift of the governors of Clitheroe school,) but new churches have been built at Crossland, Linthwaite, and Nether Thong, three townships in the parish. At Almondbury is a free grammar-school, founded in the time of James I., and on a hill in the neighbourhood may be seen the remains of an ancient castle. It is a place of very great antiquity, and said to have been the residence of some of the Saxon kings. Whether it was the Campodunum of the Romans is a matter of dispute among antiquarians.

ALMONER, anciently written Amner, was an officer in a king's, prince's, prelate's, or other great man's household, whose business it was to distribute alms to the poor. Previous to the dissolution, every great monastery in England had its almoner. The almoner of the king of France was styled his *grand aumonier,* and we find a similar officer at a very early period attached to the household of the popes.

Fleta, a juridical treatise of the time of Edward the First, describes the duties of the high almoner as they then stood in England. He was to collect the fragments of the royal table, and distribute them daily to the poor; to visit the sick, poor widows, prisoners, and other persons in distress; he reminded the king about the bestowal of his alms, especially on saints'-days, and was careful that the cast-off robes, which were often of high price, should not be bestowed on players, minstrels, or flatterers, but their value given to increase the king's charity.

In modern times the office of lord high almoner has been long held by the archbishops of York. Chamberlayne, in the *Present State of Great Britain,* octavo, London, 1755, gives an account of the lord almoner's office as it then stood. 'The lord almoner disposes of the king's alms, and for that use receives (besides other monies allowed by the king) all deodands and *bona felonum de se* to be that way disposed. Moreover, the lord almoner hath the privilege to give the king's dish to whatsoever poor men he pleases; that is, the first dish at dinner, which is set upon the king's table, or instead thereof 4*d. per diem.* Next he distributes to twenty-four poor men, nominated by the parishioners of the parish adjacent to the king's palace of residence, to each of them 4*d.* in money, a twopenny loaf, and a gallon of beer, or instead thereof, 3*d.* in money, to be equally divided among them every morning at seven of the clock at the court-gate; and every poor man, before he receives the alms, to repeat the Creed, and the Lord's Prayer, in the presence of one of the king's chaplains, deputed by the lord almoner to be his sub-almoner; who is also to scatter new-coined twopences in the towns and places where the king passeth through in his progress, to a certain sum by the year. Besides, there are many poor pensioners to the king and queen below stairs, that is, such as are put to pension, either because they are so old that they are unfit for service, or else the widows of such of his majesty's household servants that died poor, and were not able to provide for their wives and children in their lifetimes: every one of these hath a competency duly paid them. Under the lord high almoner there are a sub-almoner, a yeoman, and two grooms of the almonry.'

An account of the lord almoner's annual distribution in the king's name, on the Thursday before Easter, will be found under MAUNDY THURSDAY.

The great almoner of the king of France was once the highest ecclesiastical dignitary in that kingdom. To him belonged the superintendence of all hospitals and houses of lepers; the king received the sacrament from his hand; and he said mass before the king in all great ceremonies and solemnities. At the establishment of the imperial household in 1804, Napoleon restored the office of Grand Almoner to France in the person of Cardinal Fesch; and the office was continued till the exile of Charles X. No Grand, or other Almoners, except that of the Queen, now occurs in the *Almanach Royal et National* of France.

Ducange, in his *Glossary,* gives other meanings of the word almoner. It was sometimes used for those who distributed the legacies of others, and who have been since called executors; sometimes for a person who had left alms to the poor; and sometimes for the poor upon whom the alms were bestowed. The *eleemosynarii regis,* or persons who were supported by the king's bounty, occasionally noticed in the Domesday Survey, were of this last description. Almoner is a name also given in ecclesiastical writers to the DEACONS of churches.

ALMORAH, the capital of the province of Kumaon, in Northern Hindostan, is situated in 29° 35′ N. lat., and 79° 44′ E. long. This is the most considerable town possessed by the East India Company in that quarter of Hindostan: it stands on the ridge of a mountain 5,337 feet above the level of the sea, in the midst of a bleak and naked country, with scarcely a tree visible within four miles from the walls of the town.

Almorah is approached by a long and steep, zigzag road, which a few resolute men might defend against an army. The place was taken by the Gorkhas in 1790, at which time the inhabitants were divided into two political parties, in consequence of the succession being disputed. When in 1815 it was successfully attacked by the British, the cruelties of their Gorkha conquerors insured to our countrymen the good-will of the natives. The fortifications are very indifferent, being commanded from two points of land, and having no water within the walls. A new citadel, named Fort Moira, was built on a small eminence at the western extremity of the town, after its capture by the British, but having been constructed of loose micaceous schistus, of which the hill whereon Almorah stands is composed, the walls are already out of repair.

The town principally consists of one street fifty feet wide, and three-quarters of a mile long, with a gate at each end: this street has a natural pavement of rock. The houses stand on a lower story of stone, the superstructure being of wood; an arrangement which is rendered necessary by the frequent recurrence of earthquakes: the roofs of most of the buildings are slated, which would give a neat appearance to the town, if the inhabitants were not accustomed to pile on them stacks of straw as winter provender for their cattle.

On the conquest of Almorah, the East India Company ordered several small bungalows to be built in airy situations around it, which are appropriated to the use of such of its servants as repair to this northern hilly region for the benefit of their health.

The heat in the summer is considerable, but is always tempered by a fine breeze, and the nights even in the hottest season are chilly; frosts are common in winter, but it is remarkable that they are not so severe as 2500 feet lower down. Such vegetation as there is approaches to that of Europe. Raspberries, blackberries, cranberries, and bilberries are common. Up to a certain elevation on the hills, the birch and the willow are found, and at their base the silver fir grows abundantly.

The native inhabitants are honest, peaceable, cheerful, and industrious, but extremely dirty, and partake largely of the prevailing dislike of all innovation. Their little advancement in civilization is shown by their treatment of women, who are employed in performing the most laborious tasks. Almorah is ninety miles north by east from the city of Bareilly, and about 106 miles travelling distance north-east from Moradabad. (Bishop Heber's *Narrative of a Journey through the Upper Provinces of India.* Hamilton's *East India Gazetteer.*)

ALMORAVIDES, an Arabian tribe, who came out of the country of Himyar, and established itself in Syria in the time of the first Caliph Abubekr. They passed afterwards into Egypt, penetrated into Africa towards the west, and settled about the desert of Sahara. They extended themselves gradually, and gave the name to a sect called Molthemin or Molathemin, on account of their wearing veils. Their religion seems at a very early period to have been Christian, but, by mixing with the Mohammedans, every trace of it was lost; and even of the religion of Islam they hardly knew anything beyond the formula, *La ilah illa Allah Mohammed rasul Allah;* that is, 'There is but one God and Mohammed is his envoy.'

Yahya ben Ibrahim, a very patriotic man of the tribe of Gudala, which was one of these tribes, on his return from Mecca, meeting with Abu Amran, a famous Fakih (*i. e.* lawyer and theologian) of Fez, informed him of the state of ignorance of his tribe, and of their tractable disposition, and requested him to send some teachers. None of the disciples of the Fakih felt disposed to undertake so long and perilous a journey. Abdallah ben Yassim, a disciple of another Fakih, offered to accompany Yahya. Having met with an enthusiastic reception from the tribe, he induced them to wage war against the tribe of Lametounah, who were made to acknowledge his spiritual authority; and he gave his followers the name of *Marabauth* or *Morabitin*, which signifies men devoted to the service of religion. Abdallah having fallen in battle in the year 450 of the Hegira, A.D. 1058, Abubekr ben Omar Lametouni was appointed sovereign prince. This chief led his tribe westwards, established the seat of his empire at the city of Agmat, and laid the foundation of Marocco.

The tribe of Gudalla had declared war against that of Lamethounah, and Abubekr marched speedily to its assistance, leaving the command of the army to his relation, Yussef ben Taxfin. Yussef subdued the Berbers, completed the building of the city of Marocco, and entirely expelled the Zeïerides, commonly known by the name of Zegries, from Mauritania. Having by his exploits and by his affability won the affections of his men, he declared himself sovereign prince, and married the beautiful Zainab, sister of Abubekr. This chief having returned from his expedition, encamped before Agmat, but finding his opponent too strong to be attacked, had an interview with Yussef, and returned to his native deserts. Yussef made him a magnificent present, consisting of gold crowns, horses, mules, turbans, rich stuffs, and fine linen, with 150 black slaves, and 20 beautiful young maidens, besides a quantity of perfumes, corn, and cattle, which he continued to send to Abubekr every year till his death.

Yussef now assumed the title of Amir-al-Muslemin, or 'Prince of the Believers.' Some of the Mohammedan kings of Spain imprudently invited this ambitious adventurer to assist them against Alonso VI., who threatened to overthrow their dominion in the Peninsula. Yussef required of them to place the town of Algeciras in his power, to secure his retreat in case of a failure; but to this proposal they would not consent. The King of Seville, however, went to Marocco to hasten the expedition.

Yussef sailed for Spain in 1086, at the head of a numerous army, landed on the coast of Andalusia, and marched to Estremadura. King Alonso hastened from Aragon to stop his progress, and met the Almoravides in the plains of Zalaca. Yussef summoned him by a letter to embrace the faith of the Prophet, and to pay him an annual tribute, or prepare for battle. 'I am told,' said the Moor, 'that thou wast desirous to carry the war into my country: I spare thee this trouble. Allah brings thee into my presence that I may punish thee for thy haughtiness and presumption.' The Christian prince, indignant at this insolence, trampled the letter under his feet, and answered the messenger,—'Tell thy master what thou hast seen! and tell him also not to hide himself during the battle; let him meet me face to face.' After this the two armies engaged, and the battle was obstinate on both sides. The Christians fought like heroes, but were compelled to retreat at nightfall, and the king himself was severely wounded.

Yussef was called back to Africa, and left the command of the Almoravides to Syr ben Abubekr. The next year he returned with considerable reinforcements, and defeating, one by one, the Moorish kings of Spain, established the seat of his empire at Cordova, and caused his son Ali to be proclaimed his successor. Yussef died at Marocco, in the year 1106, at the advanced age of ninety-seven. Clemency and humanity were prominent virtues in his character. Contemporary historians state that he never pronounced a sentence of death. The vast empire of the Almoravides, which now reached from Mount Atlas to the Sierra Morena, was destroyed by the Almohades in the year 541 of the Hegira, A.D. 1147. [See ALMOHADES.] (See D'Herbelot, *Bibliotheque Orientale*. Condé, *Dominacion de los Arabes en España*. *The Chronicle* of Rodericus Toletanus. Casiri, *Bibliotheca Arabico-Hispana*.)

ALMS-HOUSE, an edifice, or collection of tenements, built by a person in a private capacity, and endowed with a revenue for the maintenance of a certain number of poor, aged, or disabled people. England is the only country which possesses alms-houses in abundance, though many such exist in Italy. In England, they appear to have succeeded the incorporated hospitals for the relief of poor and impotent people, which were dissolved by King Henry VIII.

ALNUS, or **ALDER**, is the generic name of a small group of plants belonging to the natural order *Betulineæ*. It was formerly united with the birch in the same genus, but modern botanists have separated it, because its fruit is wingless and its stamens only four.

Several species are described in botanical works, most of which are found in America, between the mountains of New Granada and Hudson's Bay: a small part belongs to Europe, and northern and middle Asia. Of these, the only species that need be noticed here, are the common, the Turkey, and the heart-leaved alders.

Alnus glutinosa, the common alder, is an inhabitant of swamps and meadows in all Europe, the north of Africa and Asia, and North America. Its favourite station is by the side of rivulets, or in the elevated parts of marshy land where the soil is drained; it does not thrive so well if placed in absolutely stagnant water. Next to the charcoal from black dogwood (*Rhamnus frangula*), that supplied by the common alder is of the best quality; and this tree is in consequence extensively cultivated in plantations belonging to the manufactories of gunpowder. Its juice contains a great abundance of astringent matter, which renders the bark valuable for tanning, and the young shoots for dyeing various colours when mixed with other ingredients; the veiny knots of its wood are cut into veneer by cabinet-makers, for ornamental purposes; and its stems, hollowed out, are among the best materials, next to metal, for water-pipes and underground purposes.

Its foliage being large, and of a deep healthy green, the alder is rather an ornamental tree; and when old it frequently becomes a picturesque object, if unbroken or uninjured by the hatchet of the woodman.

An Old Alder Tree.

Several varieties of the common alder are met with in collections, and among them one, called the *cut-leaved*, which is extremely ornamental when young: there is also another, with very much lobed leaves, called the *hawthorn-leaved*, in which almost all trace of the usual appearance of the alder has disappeared.

Alnus incana, the Turkey alder, or upland alder, is distinguished from the preceding by its more erect mode of growth, and by its leaves being destitute of clamminess, but covered instead with copious white down on the under side. It is found all over continental Europe, from Sweden to the north of Italy, and east beyond the Caucasus, as far even as Kamtchatka. Like the common alder, it shows itself in a number of varieties, among which several are of dwarfish stature; but its general character is to grow more rapidly, and to acquire a larger size than the common alder. What makes it particularly valuable is, that it will grow on light land where there are neither rivulets nor ditches; an important property, as it can scarcely be doubted, from its appearance, that it possesses whatever useful qualities are found in the common alder. Botanists seem to suppose that the Turkey alder is their *A. oblongata*, but this is a manifest error.

A. cordifolia, the heart-leaved alder, resembles but little in appearance either of the preceding. It forms a rather large, and very handsome round-headed tree, with broad, deep-green, shining leaves, deeply heartshaped at the base. It grows with rapidity, and is one of the most interesting ornamental trees that have of late years been introduced into cultivation. Though a native of the kingdom of Naples, and a most distinct species, its very existence was unknown till within a few years. It is a perfectly hardy plant, notwithstanding its southern station.

All the alders are increased with great facility by layers; they will also strike readily enough from cuttings, but the latter are longer in becoming handsome plants. Common alder is obtained by the nurseryman from seed; which should, if possible, be sown in very light, rich, damp soil, in the autumn, soon after it is ripe. If kept till the spring, even if preserved in sand, it loses in a great degree its power of vegetating; and if not kept in sand, it will scarcely ever grow at all.

ALNWICK or **ALNEWICK**, a considerable town in the county of Northumberland, 34 miles N. by W. from Newcastle, and 310 N. by W. from London, on the great road to Edinburgh through Berwick-upon-Tweed. It is situated on a declivity on the south bank of the river Aln, over which is a stone bridge of three arches. The town is well laid out; the streets spacious, well paved, and lighted with gas; the houses chiefly of stone, of modern date, and some of them of considerable elegance. The chief entrance to the town is by the four streets, 'Bond-Gate,' 'Narrow-Gate,' 'Potter-Gate,' and 'Clayport.' In the first, the ancient gate, from which it derives its name, and which was erected by Hotspur, is still standing. It would have been taken down some years since, (when another gate which had stood till then was removed,) being regarded by the town's-people as a nuisance; but it was preserved by the then Duke of Northumberland from respect for the memory of its warlike founder. In the centre of the town is the market-place, a spacious area or square: on one side of the square is the town-hall, a large and commodious stone building, surmounted with a square tower; and on another side is an elegant modern structure, erected by the present Duke of Northumberland, the under part of which is used as stalls or shambles for the sale of butchers' meat, with a fish and poultry market at the east end, and above is a very elegant assembly-room, and also a spacious reading-room, which his grace has appropriated to the use of the gentlemen of the town and neighbourhood. The church is a very handsome edifice with a neat tower, dedicated to St. Mary and St. Michael.—The living is a perpetual curacy, of which the Bishop of Durham is patron. There are several meeting houses for dissenters; and chapels for the Wesleyan and primitive methodists, and Roman catholics.

The most remarkable object connected with Alnwick is the ancient castle to the N.W. of the town, the residence of the Duke of Northumberland. This had been suffered to go very much to decay till it was completely repaired several years since; and it is now one of the most magnificent specimens in the kingdom of an old baronial residence. The building is of freestone, and as well as the repairs and ornaments is in the Gothic style, and in excellent taste. The grounds, which are five miles long, and through which flows the Aln, exhibit every species of natural and artificial beauty, including the remains of two ancient abbeys. The interior of the castle is splendid; and the chapel, with its exquisitely painted east window, its ceiling copied from that of King's College chapel at Cambridge, and its gilded and painted mouldings and stucco work, is an object worthy of attention.

The trade of Alnwick and its manufactures are not very considerable. A woollen manufactory was once established, but the undertaking failed. The market is on Saturday, chiefly for corn; and there are fairs on the 12th of May, the last Monday in July, and the first Tuesday in October. On the eve of the July fair deputies from the adjacent townships attend the bailiff of Alnwick during the ceremony of proclamation, and keep watch and ward during the remainder of the night.

The municipal government of Alnwick is in the hands of a corporation, consisting of a bailiff, (nominated by the Duke of Northumberland, as constable of the castle,) four chamberlains, and twenty-four common-councilmen. The common-councilmen are chosen from among the freemen of the incorporated companies, and the chamberlains from among the common-council. The freedom is inherited by the eldest sons, or acquired by servitude. Upon taking it up, the candidates are subjected to a ludicrous ceremony of passing through what is called 'Freeman's Well.' This is a miry pool some twenty feet across, and said to be from four to five feet deep in many places. On St. Mark's day (25th of April) the candidates, clad in white, with white night-caps, mounted, and with swords by their sides, accompanied by the bailiff and chamberlains similarly mounted and armed, and preceded by music, proceed to this pool, which is said to be deepened and stirred for their especial benefit. They then dismount, scramble through the pool, several, perhaps, being tumbled over in the bustle, and after changing their befouled garments, ride round the boundaries of the town. The tradition is that the observance of this absurd custom was enjoined by King John, as a penalty, it is said, for their carelessness in neglecting to keep up the roads near the town, owing to which he was bemired in a bog in this neighbourhood. The municipal officers have no magisterial authority, the town being under the jurisdiction of the county magistrates; but they have considerable revenues, part of which has been employed in erecting pumps to supply the town with water, and part is devoted to keeping up three free-schools for the children of freemen, to which other children are also admitted on payment of a small fee. The quarter-sessions for the county are held here in turn with Newcastle, Hexham, and Morpeth; and there is a county court monthly for the recovery of small debts. The elections for Northumberland took place here previous to the passing of the reform bill; and it is still one of the polling places for the northern division of that county. It has been said that it once returned members to parliament, but finding their salary burdensome, petitioned to be relieved from the charge.

There are several schools in Alnwick, besides those already mentioned as supported by the corporation. A national school for 200 boys was founded by the late Duke of Northumberland in 1810, on the completion of the fiftieth year of the reign of George III. There is a school for clothing and educating girls, under the patronage of the Duke and Duchess of Northumberland, and several Sunday schools.*

The situation and strength of Alnwick castle rendered it in early times one of the strongest defences against the invasions of the Scots. Malcolm III. (of Scotland) besieged it in 1093; but was killed by a soldier from the garrison, who approaching, with the keys on the point of his lance, as if he were going to surrender them, slew the king, and escaped by the speed of his horse. The story that he pierced the king in the eye, and hence obtained the name of *Pierce eye* (Percy) is a mere fable. Prince Edward, son and heir of Malcolm, attempting to revenge his death, was defeated and lost his life. In 1174 William the Lion, one of Malcolm's successors, besieged the castle with a large army, but being surprised at a distance from his camp, he was taken prisoner, and his army in consequence retreated. There was at Alnwick an abbey of Premonstratensian canons, the revenue of which, at the dissolution, was about 190*l*. The Earl of Beverley takes the title of Baron from this town: it is in 55° 24′ N. lat., 1° 43′ W. long. Population of the parish in 1831, 6788.

ALOE, a genus of succulent plants belonging to the natural order *Asphodeleæ*; it comprehends a very considerable number of species which differ from each other exceedingly in the size, form, and surface of their leaves, in stature, and in the colour, size, and structure of their flowers. The greater part of them are mere objects of curiosity, and are only seen in collections of succulent plants; but among them are species of much value, on account of their yielding the well known medicinal drug of the same name.

* A mechanic's institution was established a few years ago, and the members of the society have lately erected a handsome building.

From what particular species the resinous substance called Aloes is procured, and whether the different samples known under the name of Hepatic, Soccotrine, and Horse Aloes are yielded by different species, or are only different qualities of the same species, are points not settled.

All that appears certain is that plants nearly related to *Aloe perfoliata* of Linnæus, which some consider distinct species, while others pronounce them mere varieties of each other, are what the drug is prepared from. In all probability, all the species of the genus having an arborescent stem and thick succulent leaves will yield the substance equally well.

That which has the reputation of producing the best aloes is *A. Soccotrina;* a plant having, when old, a round stem three or four feet high; leaves of a sword form, a foot and a half to two feet long, sharp-edged, sawed, hard, and pungent at the apex, often collected in clusters at the top of the stem; and red flowers tipped with green, borne in clusters on tall stalks which rise erect from among the leaves.

[Aloe Soccotrina.]

This is a native of the Cape of Good Hope, and the Island of Soccotora, but it is now commonly cultivated in the West Indies. The processes of preparing the drug are various. Sometimes the leaves are cut off at their base and placed in iron vessels to drain, until they have discharged all their juice, which is then inspissated; in other places, the leaves are cut into slices and boiled for ten minutes, after which the water in which they have been boiled is evaporated; occasionally pressure is resorted to for the purpose of procuring the greatest quantity of juice.

Soccotrine aloes seem to be the purest kind obtained by draining only; hepatic or Barbadoes aloes are less pure, and may be obtained by boiling or slight pressure; while horse-aloes are undoubtedly a coarse preparation of the dregs of the last-mentioned.

No plants can be more easy to cultivate artificially than the aloe tribe. They are incapable of parting rapidly with water, and therefore require to be planted in a soil that is very slightly retentive of moisture, so that they may not be gorged with it by their roots; for this reason, they are potted in a compost consisting of little more than lime rubbish mixed with a small quantity of ordinary soil, and carefully drained. They require a green-house which is capable of being maintained at a temperature not less than 40° in the depth of winter, at which time they should have no water whatever; in the summer they want no fire heat, but may be watered regularly, the supply being always in proportion to their rate of growth and to the temperature of the air; that is to say, when in full growth and in a high temperature, they may have abundance of water, and when growing slowly in a low temperature they should have but very little. [See AGAVE.]

ALONSINE or ALPHONSINE TABLES, an astronomical work, which appeared in the year 1252, under the patronage of Alonso X., in the first year of his reign. They contain the places of the fixed stars, and all the methods and tables then in use for the computation of the places of the planets: but they are not made from original observations, nor is there any material difference between the astronomy contained in them and that of Ptolemy, except in two points. The length of the year is supposed to be 365 days, 5 hours, 49 minutes, and 16 seconds; which is a more correct value than had been given before, being only 26 seconds over the best modern determinations. The mean precession of the equinoxes is stated at half its real amount; being such as would carry the equinoctial points round the circumference of the globe in 49,000 years. An inequality, however, is supposed, having a period of 7000 years, by which the mean precession is alternately augmented and retarded 18 degrees. It is difficult to say whence a theory so utterly at variance with the phænomena could be derived. The general opinion is, that these tables were constructed by Isaac Ben Said, a Jew, but others suppose that Al Cabit and Aben Ragel, the preceptors of Alonso, were the real superintendents. The numbers above cited, in speaking of the precession, have been supposed from their connexion with the number 7, and the difficulty of accounting for them otherwise, to have been the ideas of a Jew. These tables are constructed for the meridian of Toledo, and the epoch 1256. They were not held in much esteem by succeeding astronomers. Regiomontanus says, 'beware lest you trust too much to blind calculation and Alphonsine dreams.' And Tycho Brahé, who reports that 400,000 ducats had been spent upon them, laments that this sum had not been employed in actual observation of the heavens. A full account of their contents may be seen in Delambre, *Hist. de l'Ast. du Moyen Age*, p. 248. Till the time of Copernicus and Tycho Brahé they continued in general use, being in truth, with some modifications, a body of Ptolemæan astronomy. They were first printed in 1483 by the celebrated Ratdolt of Venice. A copy of this *editio princeps* is in the Royal Library at Paris. Subsequent editions appeared in 1488, 1492, 1517, 1521, 1545, 1553.

ALONSO is the name of several kings of Spain and Portugal. This name is written by the Spaniards, Ildefonso, Alphonso, Alfonso, and Alonso, and by the Portuguese Affonso. We have chosen the form Alonso, as being that in most common use.

ALONSO I., surnamed the Catholic, was chosen king of Leon in 739. He was the son-in-law of Pelayo, and a descendant of King Leovigild. He wrested from the Moors Lara and Saldaña, in Castile, and extended his confined empire over nearly one-fourth of Spain. He is blamed for his cruel conduct to his enemies, whom he exterminated to a man, and formed new colonies of Christians. His cruelty may be extenuated when we consider it as a just retribution on the head of the descendants of the equally sanguinary hordes of Tarik and Muza. Alonso founded new churches in the towns which he conquered, and rebuilt or repaired the old: it is owing to his zeal for the glory of God, that the epithet of Catholic was given him. He died lamented by his subjects, in 757, and was succeeded by his son, Fruela I. (See Mariana, book vii., chap. 6.)

ALONSO II., called the Chaste, elected king of Leon in 791, was the nephew of Bermudo the Deacon. His reign was a continual scene of warfare both against the Moors and against his rebellious subjects. To this king is attributed the abolition of the disgraceful tribute of a hundred maidens, which the Spaniards were bound, from the time of Mauregato, to pay to the Moors.

The amours of his sister Doña Ximena with the Count of Saldaña—the wonderful exploits of Bernardo del Carpio, who was the offspring of this love, against the no less famous French hero Roland—also belong to this period. All this history, however, is considered by the best critics as belonging to the region of fable and romance. Alonso died about the year 843; he was succeeded by Ramiro I., son of Bermudo the deacon. (See Mariana, vii., 9. 12.)

ALONSO III., surnamed *El Magno* (the Great), King of Leon, succeeded his father Ordoño I. in 866, at the age of fourteen. In the beginning of his reign, the Count of Galicia Fruela invaded his kingdom, and forced Alonso to fly to Alava; but the citizens of Oviedo formed a conspiracy against the usurper, assassinated him, and Alonso entered the town in triumph. The Count of Alava Eilon also revolted, but was defeated and imprisoned at Oviedo, where he died a natural death. Alonso gave Navarra in fief to Iñigo Arista, with a view to oppose a bulwark to the ambition of the French, and to be better able to pursue the war against the Moors. To strengthen this compact, he married the Princess Ximena, a relation both of Iñigo and of the French kings.

Alonso now turned his attention to the Mohammedans; and in thirty years of continual warfare his arms were always crowned with victory. He extended the boundaries of his empire to the banks of the Guadiana. But Alonso, though successful against his natural foe, was not so against his domestic enemies. His own son Garcia, aided by the ever-rebellious barons, by his father-in-law the Count of Castile, by his brother Ordoño, governor of Galicia, and even by his own mother, attempted to dethrone the aged monarch. Alonso succeeded in crushing the rebellion. The son was delivered up to his father by a detachment of his own troops, and consigned to a prison; but the rebels, far from being discouraged by this misfortune, availed themselves of this to forward their cause. They roused the feelings of the people by representing to them the cruelty and tyranny of the father, and extolling the innocence of the son. Alonso, fearing the evils of a civil war, called a junta in 910, and abdicated the crown in favour of Garcia. The government of Galicia he entrusted to his second son Ordoño, and the youngest, Fruela, had that of Oviedo bequeathed to him.

Alonso, after having paid a visit to the shrine of Santiago, in Galicia, whose church had been built and enriched by him, asked troops from his son, and won, as a private individual, a fresh triumph in his old age over the infidels. Shortly after this victory, he died at Zamora, in 910. He reigned forty-eight years, and was a brave, just, and generous prince; he was succeeded by his son Garcia. (See Mariana, book vii., ch. 17—20; and the *Chronicles* of Alonso el Sabio, Rodericus Toletanus, and Lucas Tudensis.)

ALONSO IV., called El Monge, the Monk, king of Leon, succeeded Fruela II. in 925. Six years after his accession to the throne, he abdicated in favour of his brother Ramiro, and retired to the monastery of Sahagun. Two years had scarcely elapsed when he left his cell again to claim the kingdom; he was defeated by his brother, who consigned him to a monastery, and sentenced him to the loss of his eyes, according to the Visigoth code. Alonso died ten years after, and was succeeded by his brother, Ramiro II. (See Mariana, book viii., ch. 5; and the *Chronicles* of Alonso el Sabio, Rodericus Toletanus, and Lucas Tudensis.)

ALONSO V. succeeded his father Bermudo on the throne of Leon in 999, being only five years of age. The government, during his minority, was entrusted to a regency, which was a very eventful one. During it, the great Almansor was defeated, and this success led to the conquest of Cordova. Notwithstanding this victory, the Moors invaded his territories, and caused great devastations. When Alonso came of age, he made a treaty with Mohammed, king of Toledo, and gave him his sister Theresa in marriage. He endeavoured to repair the losses caused by the Saracens during his minority, rebuilt and repeopled the city of Leon, and transferred to it his residence. He attempted also to unite the crowns of Leon and Castile by marrying his son Bermudo to Ximena, the sister of the Count of Castile, and his daughter to the count, offering to the latter the title of king. This unfortunate count was inhumanly murdered on paying his first visit to his intended father-in-law, by the son of a certain Count Vela, a vassal of his father, who had fled to Leon, and had been kindly received by Alonso. This unfortunate event prevented the projected union of the two kingdoms. Alonso was killed at the siege of Viseu in 1028; his son Bermudo III. succeeded him. (See Mariana, book viii., ch. 10, 11; and the same authorities as before.)

ALONSO VI. was the son of Fernando I. He was crowned king of Leon in 1066. Fernando had committed the same fault as his father in dividing his states among his children. He left Leon to Alonso, Castile to Sancho, Galicia to Garcia, and the cities of Toro and Zamora to Urraca and Elvira, his two daughters. Alonso and Sancho lived in peace with each other only two years. In 1068, Sancho invaded the states of his brother, and defeated him on the banks of the river Pisuerga. After this battle, they made a truce for three years, at the expiration of which another engagement took place, in which the Leonese were defeated by the Castilians. Alonso was made prisoner, and confined in the monastery of Sahagun, from which, however, he escaped, and sought a refuge at the Moorish court of Toledo. In 1072 Sancho was assassinated while besieging Zamora, and Alonso hastened from his exile to take possession of the vacant throne. Asturias, Leon, and Castile acknowledged his authority. He invited his brother Garcia to his court and shut him up in the castle of Luna, where he remained until his death, and Galicia was thus added to the states of Alonso.

Having remained undisputed lord of so large a portion of the Peninsula, Alonso turned his arms against the Saracens. He invaded Portugal, and made most of the Moorish petty chiefs his tributaries. He afterwards took Coria, and then attacked Toledo; and had not the Almoravides with a powerful army invaded Spain, he would have expelled the Moors from the peninsula. He gave his illegitimate daughter, Theresa, in marriage to Henry, Count of Besançon, with his conquests in Portugal, and the title of count. During his reign, the famous hero Rodrigo Diaz de Vivar, surnamed the Cid or Sidi, the Moorish word for Lord, performed those exploits which have furnished abundance of materials to romance writers.

King Alonso died in 1109, at Toledo, in the seventy-ninth year of his age, and forty-third of his reign. He was a prince modest in prosperity and constant under adversity, and suffered with patient resignation the vicissitudes of fortune. His son Sancho having fallen in a battle against the Moors, the crowns of Leon and Castile fell to his eldest daughter, Urraca. (See Mariana, books ix., x., ch. 8—20; 1—8.)

ALONSO VII. [See Alonso I. of Aragon.]

ALONSO VIII., king of Castile and Leon, styled the Emperor. At the death of his mother, Queen Urraca, he became king in 1126. The misrule of that princess's government, and the wars which had devastated Castile during the latter part of the preceding reign, rendered the beginning of his own very stormy. He was obliged to conquer several places which still acknowledged the authority of his step-father, Alonso VII. At last the two princes were reconciled, and Alonso VIII. remained sovereign lord of Castile and Leon. About the year 1137 he was obliged to march an army into Gallicia against the Count of Portugal, Alonso Henriquez. Though the Portuguese had the advantage, Henriquez sued for peace, which Alonso readily granted.

In 1140, he formed the project of conquering the kingdom of Navarre, but was compelled to make peace with its king, Garcia. The two kings cemented this treaty by the double marriage of Garcia with a daughter of Alonso, and a son of the latter with a princess of Navarre. In his wars with the infidels, Alonso was more successful. He obtained many signal victories over them, and advanced the Castilian frontiers to Andalusia. His last battle against the Almohades was undecisive; after which he returned towards Toledo, but near the village of Fresneda he was seized with a mortal disease, and died in his tent in August, 1157. Alonso VIII. was a prince of no common qualities. He deserved the praise of great firmness and valour, by which qualities he made his state respected by his neighbours, while he enlarged it by his conquests. At the close of his reign, the military order of Alcántara, to which Christian Spain owed so much, was instituted. He was succeeded in Castile by Sancho III., and in Leon by Fernando II.; (See Mariana, books x., xi., ch. 8—20., 1—7.)

ALONSO III. of Castile was only three years of age at the death of his father, Sancho III., in 1158. His minority was a very stormy one. The two families of Castros and Laras quarrelled for the guardianship of the young king, and caused much blood to be shed. Alonso married Eleanor, daughter of Henry II. of England, in 1170, and from that time he exercised the regal authority without control. In 1195, he was defeated by the Almohades at Alarcos, but he avenged this affront in the famous battle of *Las Navas de Tolosa*, where he destroyed the most numerous army that ever crossed the strait of Gibraltar, after the first invasion, [See ALMOHADES.] Shortly after this memorable victory, he died at Garci Muñoz, in 1214; he was succeeded by his son Enrique I. (See Mariana, books xi., xii., and the same authorities as before.)

ALONSO IX., king of Leon, succeeded his father Fernando in 1188. He was dubbed a knight by his cousin, Alonso III. of Castile. For a short time the two relatives lived on good terms; but in 1189, there was a dispute between them about the possession of some territory in Estremadura. To strengthen himself against his powerful antagonist, Alonso IX. married the Princess Theresa of Portugal. This lady being his near relative, Pope Celestine III. annulled the marriage, and the parties not being willing to separate, both Leon and Portugal were placed under an interdict. In 1195, however, they complied with the order of the pope.

Alonso continued a most distressing warfare against his cousin, the king of Castile, but at last this prince gave him his daughter Berengaria in marriage, from whom Alonso IX. was also forced by the pope to part on the same plea of relationship. The marriage, however, was not dissolved without first having obtained from the pope a declaration of the legitimacy of their children. This measure led again to a war between the two princes, but by the mediation of the pope, a reconciliation was effected.

Alonso now directed his arms against the Moors, and conquered Merida, Caceres, and other important places in Estremadura. After having subdued almost all that province, he dismissed his army; and while on his road to Santiago, he died at Villanueva de Sarria, in 1230, after a very stormy reign of forty-two years. His son Fernando III. succeeded to the crowns of both Leon and Castile. (See Mariana, books xi., xii., ch. 16—22; 1, 2; *Chronicle* of Alonso el Sabio.)

ALONSO, or ALFONSO X., surnamed *El Sabio*, (the Wise,) King of Castile and Leon, was the son of Ferdinand III., called the Saint. He was born in 1222, and on the following year was acknowledged crown prince by the Cortes at Burgos. While crown prince he took the kingdom of Murcia from the Moors, and accompanied his father to the conquest of Seville. In 1252 he was proclaimed King of Castile and Leon, in the city of Leon, after his father's death. The first act of his reign was to renew the alliance with Alhamar, the Moorish king of Granada, and to relieve him from the tribute which he paid to Castile, in acknowledgment of the eminent services which that king had rendered to his father.

The public treasury was exhausted by the long wars of the preceding reign, and Alonso, in order to improve his finances, had recourse to a measure, which must always prove dangerous. He caused the *escudo burgales* to be put in circulation, instead of the *pepion*. Both these coins were of equal nominal value, but the former much inferior in intrinsic worth. This measure increased the distress, obliged the king to raise the salaries of the public functionaries, and was the cause of the civil discord which ended with his dethronement.

In 1256, the Emperor of Germany being dead, some of the electors proposed Alonso as a candidate, on account of his literary qualifications, but more particularly for his relationship to the deceased emperor by his mother's side. The Archbishop of Cologne, in his name and in that of the bishop of Mayence, and the count Palatine, chose Richard, Earl of Cornwall. The Archbishop of Treves and the Elector of Saxony considered the election as invalid, and chose Alonso. Ambassadors were sent to Castile, but the king, owing to some domestic embarrassment, was unable to be present in Germany.

The Moors of Spain having received considerable reinforcements from Africa, made an irruption in the territory of Castile, and reconquered Jerez, Arcos, Medina-Sidonia, Bejer, San-Lucar, and other places; but their triumph was of short duration. On the following year, Alonso, with a considerable force, marched against them, defeated them in a succession of battles, and forced the King of Granada to do homage to Castile, and pay a considerable sum as an indemnification for the expenses of the war.

In 1265, his first cousin Maria, the wife of the unfortunate Baldwin II., Emperor of Constantinople, came to Spain, to implore the assistance of her relative for the delivery, according to some historians, of her husband, who was detained in captivity by the sultan of Egypt; and, according to others, of her son, retained by the Venetians as a pledge for a certain sum lent by them to Baldwin when he was reduced to great distress by the King of Bulgaria. Alonso generously gave her 30,000 marks of silver.

In 1269, the marriage of Fernando de la Cerda, Alonso's eldest son, to Blanca, daughter of St. Louis, King of France, was solemnized; and in 1271, Castile began to experience the terrible scourge of a civil war. Alonso had reconquered Murcia, and was occupied in organizing that province, when the King of Granada came to complain of the injury that Alonso had done him by secretly countenancing the rebellion of his subjects in Guadix and Malaga. The answer of Alonso sent Alhamar back more dissatisfied than he came. The restless Laras, and Philip, the unnatural brother of Alonso, now saw an opportunity of gratifying their resentments, by urging the Moorish king to take up arms against Castile, and by promising that they, with other barons, would openly pass over to his side.

The king having been acquainted with this plot, left Murcia and went to Valencia, to consult with his father-in-law, the king of Aragon; he also sent his ambassador, Arana, to the turbulent nobles assembled at Palencia, and ordered his son, Don Fernando, then at Seville, to prepare himself for the impending war. Arana was unsuccessful in his mission. The king now convoked the Cortes at Burgos, and summoned the rebellious grandees, offering them a safe conduct. In order that the Cortes might deliberate with more freedom, he ordered it to be held at the Hospital Real, out of the city. After several tumultuous debates the assembly was dissolved, and the parties separated, more embittered against each other than before. The insolent barons in leaving Burgos devastated all the country round, and several of them went over to the Moors. The complaints of the nobility were chiefly these:—that their privileges had been sacrificed to please the people; that their military service was too long continued; that their contributions were too heavy; and that they could not submit to be judged by the supreme courts of Castile.

In 1273, Rudolph of Hapsburg was elected emperor of Germany. The King of Granada also having died this year, the plans of the nobles were partly frustrated; and Alonso felt the more desirous to settle his domestic affairs at any cost, in order to be better able to forward his pretensions abroad. He therefore again convoked the states at Avila. Some of the grandees visited him privately, and appeared better disposed for peace. The queen and the Archbishop of Toledo went to Cordova, and endeavoured to reduce the others to obedience. Alonso then proceeded to Seville. The new King of Granada, the rebel barons, and the prince Fernando, his son, came from Cordova to Seville, and being very kindly received by the king, civil discord was for a time appeased.

The King of Marocco, Aben Yussef, availing himself of the absence of Alonso in France, where he had gone to have an interview with the pope, made a descent on Andalusia with a powerful army. Nuño de Lara wrote to the prince regent to come to his assistance, and, inviting the nobility of Andalusia to unite against the common enemy, offered battle to the Moors near Ecija, but lost it, with his life. Prince Don Fernando, hastening to his assistance, died at Villa Real. The Archbishop of Toledo was also defeated near Jaen. Don Sancho, the king's second son, undertook with more success the defence of the country. He conquered the Africans in several encounters, and at last made a truce for two years with Yussef, and the Moorish king re-embarked with the rest of the army for Africa. Sancho immediately hastened to Toledo, under the pretence of visiting his father on his return, but his true object was to establish his claims to the throne against his nephew, the son of Don Fernando. At the request of Alonso's brother, who was in favour of Sancho, the Cortes were assembled at Segovia to settle the question. This body, in consideration of the services rendered by Sancho, and to avoid the danger of a long minority, decided that Sancho should succeed his father. The king refused to sanction this proceeding, and the country became the theatre of a disastrous civil war.

To meet the exigencies of this war, Alonso had again recourse to an alteration of the circulating medium, and a coin of inferior intrinsic value to the standard was put in circulation. This measure greatly irritated the people; and notwithstanding a recent victory over the Moors of Granada, he was every day more disliked. In 1282, he summoned the Cortes to Toledo, with the view of bringing his son to obedience by pacific and legal means. Sancho, instigated by his uncle and the nobility, called the Cortes to

Valladolid, which was more numerously attended than the meeting at Toledo. This body offered him the crown, which he refused to accept; but his uncle in the name of the nobility pronounced the sentence of deposition against his aged brother, and proclaimed Sancho king of Castile and Leon and father of the country.

Alonso, seeing himself now abandoned by the nobility and the people, deposed by his unnatural relations, and deserted by all his friends, went to his ever-faithful Seville, and from that place wrote a letter to Alonso Perez de Guzman, who was at Marocco, and enjoyed the favour of Aben Yussef, describing to him in the most affecting manner the terrible situation in which he was placed, and requesting the aid of the African monarch, as a pledge for which Alonso sent to Yussef his royal crown. This prince immediately dispatched Guzman with a considerable sum to Seville, and soon after himself, at the head of a numerous army, made a descent at Algeciras. At Zahara the two kings had the first interview. Alonso rose from his seat and offered it to Yussef, but the African monarch would not accept this honour, and courteously said to the Castilian, 'Sit thou there, who art a king from the cradle: I am one only through my valour.' After treating about the best manner of conducting the war, the Africans marched to besiege Cordova, where the prince was.

Alonso returned to Seville, and collecting as great an army as he could muster, proceeded to join the besiegers. The garrison defended the town with courage, and after twenty days the siege was raised. The Moors retired to Ecija, having done nothing but devastate all the country round. Alonso, while on his march towards that place, being informed that Yussef intended to keep him prisoner, secretly went to Seville. The African chieftain, feeling offended that his loyalty should be put in doubt, re-embarked for his country, not, however, without leaving to his friend a thousand chosen horsemen, and requesting to be permitted to keep them in his own pay.

Alonso now held a solemn *junta* at Seville, and disinherited Sancho, pronouncing a curse against him as a rebellious and unnatural son. Sancho, however, was not at all affected by this proceeding; on the contrary, his party became every day stronger. His father again called Yussef, but, to give a better colour to this step, he was advised to direct his arms against the King of Granada, who had embraced the cause of Sancho. He also endeavoured to obtain assistance from France. At last he employed the arms of religion, and requested of Pope Martin V. to excommunicate his son. The pope complied with his wishes, and the rebellious towns were placed under an interdict. Sancho began to be deserted by all his friends: the first who set the example were his two brothers. Some of the towns revolted against him and returned to their allegiance. His kind father again tried means of reconciliation, and an interview was planned, but did not take place.

Alonso returned to Seville, and, overpowered by so many misfortunes, died on the 21st of April, 1284. In his will he expressed his desire that his grand-children, the sons of Fernando, should succeed him, and in case of their death, the King of France, and made no mention of Sancho, who, however, succeeded him. Alonso was buried at Seville. 'His sepulchre,' says Mariana, 'is not very rich, nor was it necessary that it should be so; for his life, notwithstanding his faults and the calamities that happened to him, renders his name and memory eternal. He would have been a greater king if he had possessed the knowledge of himself, and had not stained his excellent qualities by ambition and severity. He was the first king of Spain who ordered all public documents to be written in Spanish, with the view of polishing and enriching the language. He caused also the Bible to be translated. It is indeed astonishing,' adds he, 'that a king who had been brought up in war, and exercised in arms from his early youth, should be acquainted with astronomy, philosophy, alchemy, jurisprudence, and history, to a degree scarcely attained by men enjoying a life of leisure, or having no other occupation than study.' He has left us a monument of his learning, or of his patronage of learning, in his *Chronica de España*, in the astronomical tables called *Alfonsinas*, in a code of laws denominated *Las siete Partidas*, and in some poems and other productions, which are still unedited.

His enemies have endeavoured to deprive this learned prince of the merit of having been the author or compiler of *Las Partidas*, pretending that this code was written by his father. It is, however, worthy of remark, that every one of the Partidas begins with one letter of his name, forming the following acrostic:—

1st. A l servicio, &c.
2d. L a fé católica, &c.
3d. F izo nuestro Señor, &c.
4th. O nras señaladas, &c.
5th. N ascen entre, &c.
6th. S esudamente, &c.
7th. O lvidanza y atrevimiento, &c.

The accusation of blasphemy, with which they have also branded his name, is, in our opinion, a fabrication. It rests on no other authority than a revelation which an Augustine monk at Molina had from heaven. This miracle is related at full length in the History of Spain and Portugal in Lardner's *Cabinet Cyclopædia*, Appendix I., vol. ii., p. 317. (See *Chronica del Rey Don Alonso* (British Museum); Mariana's *Historia de España*; Garibay's *Compendio Historial de las Chronicas*; Nicolao Antonio, *Bibliotheca Hispana vetus*; *&c.*)

ALONSO XI. king of Castile and Leon, succeeded his father Fernando IV. in 1312, being only a few months old. A long series of convulsions attended his minority. When he came of age he quieted the intestine disturbances, and seriously pursued the wars against the Infidels. He took Tarifa and Algeciras from them, but died of the plague while besieging Gibraltar, in 1350. His memory would have for ever been cherished by the Spaniards, had he not stained it by the murder of his kinsman Juan el Tuerto, and his amours with Doña Leonor de Guzman. He was succeeded by his son Pedro the Cruel. (See Villasan's *Cronica del Rey Don Alonso el Onceno.* Mariana, book xv.)

ALONSO I., King of Aragon, surnamed El Batallador, the Battler, succeeded his brother Pedro in 1104, and having married Queen Urraca of Castile and Leon, was styled king of those provinces also. The unprincipled conduct of his wife was not calculated to render so virtuous a man as Alonso happy. He applied to the pope to annul his marriage; and in 1114, a council assembled at Palencia solemnly decided on the separation of the ill-sorted couple.

Alonso, now free from internal troubles, turned his attention to the war with the infidels, and in a succession of victories rescued from their grasp almost all the territory south of the Ebro. He laid siege to Saragossa, and after four years of struggle he entered it by capitulation, in 1118, and made it the capital of Aragon. In 1120 he defeated a numerous army of the Almoravides near Daroca. Tarragona, Meguinenza, and Calatayud were also among his conquests; and he carried his victorious arms even to Andalusia.

In 1134 he invested Fraga, when the wali of Valencia, Aben Gama, advanced with a considerable force to relieve the town. The latter offered battle to Alonso, which he gallantly accepted, but the Christians were defeated, and their king killed. Alonso I., notwithstanding the charge of cruelty, in his wars against his wife and step-son, made against him by the Castilian chroniclers, was a brave and virtuous prince. He was succeeded by his brother Ramiro II. (See Florez's *España Sagrada*; *Chronica Adefonsi Imperatoris*, vol. xi.; Rodericus Toletanus, *De Rebus Hispanicis*; Mariana, x. 8.)

ALONSO II. succeeded his mother Petronila on the throne of Aragon when he was only eleven years of age. In 1167 he became Lord of Provence, by the death of his cousin, Count Gerard. He extended the frontiers of his kingdom on the side of the Mohammedans, penetrated into the territory of Valencia, and aided Alonso IX. of Castile in investing Cuenca. For this important service Aragon was made exempt from paying homage to Castile. Alonso died in 1196; and according to a custom very prevalent in Spain at that period, he divided his states between his children, leaving Aragon, Catalonia, and Roussillon to his eldest son, Pedro II.; and Provence to the second son. (See Rodericus Toletanus. Mariana, xi. 9—13.)

ALONSO III. was the son of Pedro III. King of Aragon. At the death of his father, in 1285, he was at Mayorca, where he had been sent by his father to dethrone his uncle Jaime, who had usurped the sovereignty of that island. Having succeeded in his expedition, he returned to Aragon, and found the Cortes assembled at Saragossa. This body sent a deputation to meet him at Valencia to express their surprise at his having assumed the title of king previous to his taking the customary oath before the Cortes of the realm. Not without great difficulty, and after many tumultuous debates, Alonso was acknowledged king, upon submitting to all the conditions required by that body.

Having thus settled matters at home, he turned his attention abroad. The dethroned King of Mayorca, now Lord of Roussillon and Montpellier, invaded Catalonia, but on the approach of Alonso he retreated. The Aragonese crossed the frontiers and laid waste the French territory. Besides this enemy, Alonso had to contend with the pope and the King of France, who strongly advocated the cause of Charles of Anjou, Prince of Salerno, then a prisoner of Alonso. Through the mediation of Edward I. of England, Charles obtained his liberty upon the promise of renouncing his right to the throne of Sicily, and obtaining the approbation of the pope and the King of France to this measure; in case he could not succeed, he was to return voluntarily to his confinement. Charles was unsuccessful, and Alonso, though he saw the united power of France and the pope threatening him, was not inclined to yield; but at the persuasion of Edward peace was obtained, although on conditions somewhat humiliating to Alonso. Edward offered him the hand of his daughter Leonora, but before the negociations were terminated Alonso died at Barcelona, in 1291, and was succeeded by his brother, Jaime II. (See Zorita's *Anales de Aragon*, vii.; Mariana, xiv.)

ALONSO IV., son of Jaime II., ascended the throne of Aragon in 1327. The Genoese not only fomented dissension in his new conquests of Sardinia, but even dared to attack him in his own kingdom. They made various descents on Catalonia and Valencia, but were repulsed. At home, his son and successor Pedro raised the standard of revolt against him, because his father had given some possessions to his half-brother Alonso. These dissensions were in a great measure the cause of his death, which took place in Barcelona in 1336. He was succeeded by his son, Pedro IV. (See Zurita's *Anales*, book vii.; Mariana, book xvi.)

ALONSO V. [See Alfonso I. of Sicily.]

ALONSO I., King of Portugal, was the son of Henry, Count of Besançon, who held Portugal in fief with the title of Count. At his father's death Alonso was only two years old, and his mother governed the state in his minority. This princess was not very exemplary in her conduct, and when her son became of age, he was forced to apply to arms and wrest the sovereignty from her, or rather from her paramour, Fernando Perez. He was also several times at war with his cousin Alonso VIII. of Castile, but in 1137 they made peace, and the Portuguese count being disengaged from his domestic enemies, turned his mind to foreign affairs.

He assembled his army at Coimbra, with a view to attack the infidels. The King of Badajoz and four other Moorish chieftains also mustered an army, far superior in numbers to that of the Portuguese. Though the count had the advantage of a superior position, his soldiers, seeing the immense number of the unbelievers, began to show signs of fear. Alonso encouraged them with the assurance of the protection of Heaven. The struggle was severe on both sides, and at last victory declared for the Christians. An incredible multitude of Africans remained dead on the field, the number of which is estimated by the Portuguese historians at 200,000. In the exultation of victory, the count was proclaimed king by his followers, which title he assumed from that day. This battle was fought in the plains of Ourique, in the province of Alemtejo, in the year 1139.

In 1146 Alonso took by assault the fortress of Santarem from the Saracens, and put to the sword all its inhabitants without distinction of age or sex. In the next year he took Lisbon, when the fleet of English crusaders, who were going to the Holy Land, rendered him very effectual assistance. He afterwards reduced Cintra, crossed the Tagus, and possessed himself of several towns in Estremadura and Alemtejo. In 1158 he reduced Alcazar-do-Sal after a siege of two months. In short, Alonso almost freed all Portugal from the yoke of the Saracens.

This king, the founder of the Portuguese monarchy, was not a warrior only—he was also a legislator. Under his reign a code of laws was promulgated at the Cortes of Lamego. These laws chiefly treated on the succession to the crown, the duties of the nobles and the people, and the independence of the kingdom.

Alonso died in 1185, at Coimbra, in the 91st year of his age. His memory is deservedly held in the highest veneration by every true Portuguese. He was succeeded by his son Sancho I. (See Brandaon's *Monarchia Lusitana*; *Chronicon Lusitanum*; Mariana, book x.—xi.; Lemos, book ix.)

ALONSO II. ascended the throne of Portugal in 1211, on the death of his father Sancho I. He began his political career by endeavouring to deprive his sisters of the castles bequeathed to them by their father. This step led to a war with the King of Leon, who espoused the cause of the infantas. This war was productive of many evils to his kingdom. In his conquests over the Saracens he did not signalize himself so much as his predecessors had done. Alonso seemed not to have held the church in very high veneration, as he subjected the clergy to personal military service, and their possessions to contribute the same as the laity towards the support of the state. In fact, he attempted to abolish entirely all ecclesiastical immunities. The consequence of these measures was that Pope Honorius III. placed the kingdom under an interdict. Alonso was forced to yield, and was pardoned on his promise of making ample satisfaction for his past offences. Before he could fulfil his promise he died, in 1223, and was succeeded by his son, Sancho II. (Rodericus Toletanus, book viii.; Lemos, book xii.)

ALONSO III. succeeded his brother Sancho II., in 1248. Before his accession, through some cause not sufficiently stated by the historians, he was a poor exile in France, when Matilda, Countess of Boulogne-sur-Mer, not only gave him protection, but, together with her hand, conferred on him her states and property. His brother having attacked, like his father, the immunities of the church, was, by a decree of Innocent IV., deprived of the regal authority, and Alonso entrusted with the administration of the government.

Having sworn allegiance to the pope, Alonso sailed for Lisbon, and on his arrival was received with enthusiasm by all classes of the nation. His brother finding himself deserted by his subjects fled to Castile, and after some fruitless attempts to procure his restoration, retired to Toledo, where he died in 1248.

Alonso embroiled himself with his namesake of Castile about the possession of Algarve, but finding his antagonist too powerful for him he sued for peace. The treaty was confirmed by Alonso's marriage with Beatriz de Guzman, a natural daughter of the Castilian, the Portuguese king shamefully deserting his great benefactress, the virtuous Matilda, on the plea of her barrenness. Alonso's conquests from the Mohammedans were not very numerous. He died in 1279, after a reign of thirty-one years, and was succeeded by his son Dennis. (See *Chronica Conimbricensis*; Mariana, book xiii.; Lemos, book xiii.)

ALONSO IV., surnamed the Brave, ascended the throne of Portugal on the death of his father Dennis in 1325. During his father's lifetime he rebelled against him through jealousy of the partiality shown by Dennis to his illegitimate son Alonso Henriquez. Several times both father and son were reconciled, and again gave way to their uncontrolled passions, plunging their unfortunate nation in all the horrors of civil discord. Shortly after their last reconciliation Dennis died, and his son Alonso was acknowledged king of Portugal.

His first act was to exile his illegitimate brother, and deprive him of his honours, and even of the Duchy of Albuquerque, which he held by his marriage with the heiress of that family. In the early years of his reign he almost entirely abandoned the concerns of the nation to devote himself to his favourite amusement of hunting. Through the intrigues of the Infante Juan Manuel, he was embroiled with his son-in-law Alonso XI. of Castile. Scarcely was his dispute with the Castilian settled, when he had to encounter disturbances of a more serious nature, in the unlawful intercourse of his son Pedro with Inez de Castro his mistress. His own weakness, and a mistaken zeal for the welfare of his kingdom, induced him to give his consent to the barbarous murder of that unfortunate lady, which plunged the state into a civil war. Pedro raised the standard of rebellion against his father, and possessed himself of almost all the north of Portugal. After much bloodshed a reconciliation was effected between father and son, and not long after Alonso died tormented by the remembrance of his murderous deed. As he had been a disobedient and rebellious son, so Heaven permitted his crime to be visited on him, by the same conduct from his own son. His death took place in 1357, after a stormy reign of thirty-two years, and he was succeeded by his son, Pedro I. (See *Chronicon Conimbricense;* Lemos, book xvii.)

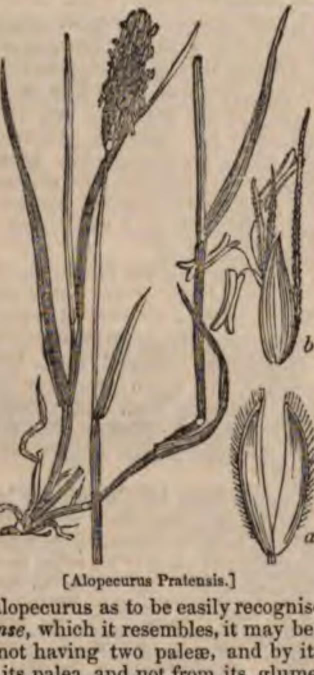
ALONSO V. was the son of Duarte. At the death of his father in 1438 he was only six years of age. His minority was very disturbed and eventful. His mother, Leonora of Aragon, who was appointed regent by her husband, was, as a foreigner, obnoxious to the Portuguese nobility. Three uncles of the young king disputed the regency with her, and, after much bloodshed, she was obliged to quit Portugal, leaving the government in the hands of the Infante Pedro, the most politic and ambitious of the young king's uncles. In 1446, Alonso having reached his fourteenth year, seized the reins of government. The conduct of the young king, at first, was such as to promise a happy reign; but the enemies of the regent Pedro soon gained his favour and kindled the torch of a civil war, which ended with the death of the ill-fated regent.

In 1457 Alonso fitted out an expedition against the Moors. He landed in Africa with 20,000 men, and took Alcazar, Seguer, and Tangier. Notwithstanding his partial success, he encountered many reverses. He also engaged in an unfortunate war with Castile; and not long after, having concluded a peace with that nation, died of the plague in 1479, in the forty-ninth year of his age, and forty-third of his reign.

Alonso V. collected a copious library, and gave his protection to all literary persons. He was succeeded by his son Joaõ II. (See Ruiz de Pina's *Chronica do Senhor Rey Dom Affonso V.;* Mariana, book xxi.; Lemos, book xxvi.)

ALOPECU'RUS is a genus belonging to the natural order *Gramineæ*, or grasses, and is distinguished from all other British kinds, by its flowers, which grow in close cylindrical heads, consisting of two glumes (*a*) of equal size and a keeled, compressed figure, enclosing a single palea (*b*), from the base of which arises an arista or beard. It contains many species, the only important among which is

Alopecurus pratensis, the meadow foxtail grass, a valuable plant to the farmer. It is so much larger than any other British alopecurus as to be easily recognised, and from *Phleum pratense*, which it resembles, it may be immediately known by its not having two paleæ, and by its beard proceeding from its palea and not from its glumes. It grows commonly in meadows, where it forms rather a coarse, but an abundant and early herbage, of which cattle are very fond. In such situations it is invaluable, but it becomes worthless if sown on light dry soil.



[Alopecurus Pratensis.]

ALOST, or AALST, a town of East Flanders, on the Dender, fifteen English miles W.N.W. of Brussels, 50° 56′ N. lat. 4° 5′ E. long., has a population of above 12,000, who carry on a considerable trade; vessels of small size being able to ascend the river as far as Alost. Good hops are grown in the neighbourhood, and there is a considerable hop-market in Alost.

The streets of Alost are kept very clean by a number of volunteer male and female scavengers, who sweep up the dirt into small heaps and carry it off to certain places assigned for this purpose, where it lies till they can dispose of it to the farmers in the neighbourhood. The farmers have a kind of religious feeling in favour of the manure collected by these poor people, and think that their charity in purchasing, at a somewhat higher rate, from these industrious scavengers will ensure them a better crop. The street-sweepers show a most conscientious scrupulousness in not invading the dung-heaps of their neighbours.

ALP ARSLAN, (*i.e.* the Brave Lion,) or with his complete name, Mohammed ben Daud Alp Arslan, born A.D. 1030, was the nephew of the Seljukide Sultan Togrul Beg, whom the Abbaside Caliph Kaïm-biamr-illah had, for the protection of his throne, invested with the dignity of Emir al Omara, or Commander-in-chief of the whole empire, and who, when nearly seventy-five years old, had also married a very young daughter of that caliph. Togrul Beg died in 1063, and as he left no children, his nephew, Alp Arslan, who had till then been governor of Khorasan, succeeded him as sultan of the Seljukes. Alp Arslan restored the youthful widow of Togrul Beg to her father, demanding, at the same time, to be appointed Emir al Omara in the place of his uncle, a request which the caliph could not refuse. One of the first acts of Alp Arslan's reign was to put to death the grand vizir of Togrul Beg, together with six hundred of his adherents. Nizam-al-Mulk, who was chosen for that office by Alp Arslan, has earned the reputation of one of the greatest statesmen of the East. Alp Arslan was about to extend his dominions by conquests in Transoxiana, when a revolt in Azerbijan, instigated by Kutulmish, required his presence there. He defeated the rebellious prince near the city of Rei, and resumed in the ensuing year (1065) his conquests in Transoxiana, while his vizir Nizam-al-Mulk endeavoured to promote the welfare of the interior, and to advance the interests of literature and education by establishing colleges in the principal towns of the empire. The greater part of Syria was at this time already in the hands of the Turks, and the troops of the Greek emperor offered but little resistance to their further progress. Romanus Diogenes, who came to the throne in 1068, resolved to take more vigorous measures against them. He joined his army in person, and defeated the Turks in several battles in Cilicia and near Malatia; but he was unsuccessful in an expedition against Khelat, and was, in 1071, taken prisoner in a battle near Malazkurd (or Melezghird) in Armenia. Alp Arslan treated him generously, and on his promise to pay a considerable ransom, released him and all the noble prisoners from their captivity. But the Greeks had, in the mean time, placed Michael Parapinacius upon the throne, by which circumstance Diogenes was prevented from fulfilling his engagement. This caused a renewal of hostilities. Alp Arslan's son, Malek Shah, conquered Georgia, while the sultan himself was preparing an expedition against Turkestan. He crossed the Jihon, and commenced the war by taking the fort of Berzem; its governor, Yussuf Kothual, was led before Alp Arslan as a prisoner, and when reproached by him for the trouble he had given him by his long and useless resistance, became so incensed, that he rushed upon the sultan, and with a dagger inflicted a mortal wound upon him, of which he died (1072.) Alp Arslan was buried at Merw in Khorasan. His son Malek Shah succeeded him in the government.

ALPES, BASSES, (*The Low Alps,*) is one of the departments formed out of the old Provence, with the addition of the rich valley of Barcelonette, which was in Dauphiné. It is on the frontier, and has the county of Nice, in the continental dominions of the King of Sardinia, on the E.; on the S. it is bounded by the department of the Var, on the W. by that of Vaucluse, and on the N. by that of the *Hautes Alpes* (High Alps). It lies between 43° 41′ and 44° 40′ N. lat.

The chief river is the Durance, a rapid stream which rises near Mont Genèvre, passes through the department of the Higher Alps, and, after separating it from that of the Lower Alps, enters the latter, and crosses it from N. to S., ultimately falling into the Rhone a little below Avignon. The tributaries of this stream are the Ubaye, the Bléone, the Asse, and the Verdon, which last forms the southern boundary of the department. These successively fall into the Durance on its left bank. The rivers and streams of this department often cause great mischief when they overflow their banks. The surface of the department includes 2811 English square miles, with 153,000 inhabitants, being about

54 persons to a square mile,—a smaller proportion than in any other department except Corsica. It sends two deputies. This scanty population may be taken as indicating a barren soil and an unfavourable temperature, which we should also expect from the mountainous character of the district. The high valleys are covered with snow during six months of the year. Some of the valleys are, however, more fertile; that of Barcelonette, watered by the Ubaye, affords pasturage to numerous flocks of sheep and herds of oxen; while Digne, in the otherwise desolate valley of the Bléone, is surrounded by meadows and orchards, vineyards and olive plantations. Nearly 25,000 acres are devoted to the culture of the vine, and about 140,000 are occupied by wood. The potato is cultivated to a considerable extent. There are salt springs near Castellane, but it does not appear whether they are now turned to account; and mineral waters at the village of Greoux, in the S.W. angle of the department. The department contains lead, calamine, some coal, copper, and iron. A singular custom prevails among the peasants between Sisteron and Digne, of wrapping the dead in a winding-sheet, placing them on the roofs of the huts, and covering them during the winter with snow. There are several antiquities in the department, especially the remains of some ancient temples near the little town of Riez, near the southern border. Digne is the capital of the department, but, excepting on this account, has few claims upon our notice. It is situated in the midst of mountains, and has steep and narrow streets, enclosed by old walls. Its chief buildings are the cathedral, and the residences of the prefect and the bishop. It carries on a trade in dried fruits, and has a population of about 4000. There are a college and a library, as well as a society of agriculture. Digne is 465 miles S. E. by S. of Paris. There are some tolerably well-frequented warm springs in the neighbourhood; and the small village Champtercier, not far off, was the birth-place of the philosopher Gassendi. Sisteron, about equal to Digne in population, is 24 miles N.W. of that town, measuring by the road, which takes a considerable circuit. The altar of the cathedral is adorned by a fine painting by Wanloo. Barcelonette, N.E. of Digne, has a population of 17 or 1800; Castellane, S.E. of Digne, is rather more populous; Forcalquier, S.W. of Digne, has rather more than 2100 inhabitants. Each of these four is the capital of an arrondissement, of which divisions there are five, the remaining one being that of Digne. Riez, noticed above, has nearly 3000 inhabitants.

ALPES, HAUTES (*The High Alps*), a department, lying along the northern boundary of the last-mentioned, which it resembles in its physical character. The branches of the magnificent mountain chain from which it takes its designation, pervade it, and form valleys, through which the Durance, and the minor streams which fall into it or into the Isère, (another tributary of the Rhone,) take their way. The upper part of the course of the Durance is entirely in this department; it rises near Mont Genèvre on the eastern frontier; it receives on the right the Gursane, the Gyronde, and the Buech, a longer stream than the other two, and which does not join the Durance till after it has entered the department of the Low Alps; on the left it receives the Servies and the Guil. The Drac flows first in a westerly and then in a northerly direction, and falls into the Isère, in the department so called, which adjoins that of the High Alps on the N.W. The N.E. boundary is formed by the main chain of the Alps, which separates the French and Sardinian dominions; and the communication between these at this part is by the pass of Mont Genèvre, about 6480 feet above the level of the sea. [See GENEVRE, MONT.] To the W of the department is that of Drome.

Several of the summits in this department are among the loftiest of the Alps. The highest point is Mont Pelvoux de Vallouise, which is 13,438 English feet above the level of the sea. Mont Viso, which, if not in the department, is upon the Piedmontese frontier, is about 12,580 feet high. Mont Genèvre is 11,788 feet high, (M. Brun.) The mountains cover two-thirds of the department, and in the narrow valleys the snow lies on the ground so long as to impede the operations of the farmer. The slopes, however, furnish pastures for sheep, which have fine wool and flesh, and for goats. About 17,000 acres are devoted to the cultivation of the grape; nut-oil is also made. The quantity of wood-land is greater than in the department of the Low Alps, being about 180,000 acres. The mineral wealth of this department is considerable, and includes copper, lead, zinc, iron, antimony, &c. The population is 125,000, being rather larger in proportion to the surface (2101 square English miles) than in the department just referred to. It sends two deputies.

The department is divided into three arrondissements, *viz.* Gap, Embrun, and Briançon; Gap, the capital, is a town of 7000 inhabitants, situated in a small plain bounded by mountains, which form an amphitheatre. [See GAP.] Briançon is not far from the source of the Durance, and is remarkable for its strong position and its elevation, being about 4280 feet above the level of the sea. Its inhabitants, 2800 in number, carry on a trade in woollen and cotton goods, and cutlery. Embrun, much lower down the stream, has 2300 inhabitants, possesses a fine episcopal palace, (for it was once the seat of a bishopric,) and a still finer cathedral, said to have been built by Charlemagne. In Lake Pelhotiers near Gap is the 'Trembling Meadow,' a small floating island. (For the heights of the mountains, see *Orographie de l'Europe*.)

ALPES, MARITIMES, a department formed out of the county of Nice and the principality of Monaco, while these belonged to France, but which was done away when they were ceded by France in 1815.

ALPHABET is the name given to the series of letters used in different countries at different times. The term is borrowed from the Greek language, in which *alpha, beta*, are the first two letters; or if we go a step farther back, we should derive the word from the Hebrew, which gives to the corresponding letters the names *aleph, beth.* Thus the formation of the word is precisely analogous to that of our familiar expression, the *A*, *B*, *C;* and some writers have found a similar origin for the Latin name given to the letters, viz. *elementa*, which, it must be allowed, bears an extraordinary similarity in sound to the three liquids, *l*, *m*, *n;* but to make this derivation satisfactory, it should be proved that these letters were at one time the leaders of the alphabet, for otherwise it would be difficult to account for the selection of a name from them in preference to the rest.

Among the different causes which have promoted the civilization of man, there is none, we might almost say, which has been so fruitful as the invention of the alphabet; and the very circumstance of the invention being essential to this effect, and therefore preceding it, has made it a task of some difficulty to point out the mode in which the discovery was made, for historical evidence upon such a point must be very imperfect. The present age, however, has nearly surmounted this difficulty, and we begin to see pretty clearly at least how the discovery *might* have been made, perhaps how it actually was made. Oral language itself, we might almost infer *à priori*, originated in an attempt to imitate by the organs of the human voice those different sounds which nature, in her animate and inanimate forms, is constantly presenting to our ears. By his powers of articulation man could imitate those sounds at pleasure, and thus recall to the minds of those around him the notion of absent objects and past actions with which the sounds were connected. Thus, in its various forms and combinations, the single principle of *sound* would afford a vast number of symbols which might be made to represent, at first, the material objects of nature, or the action of those objects upon one another. The transference of these signs from particular objects, that make an impression on the *ear*, to the expression of abstract qualities, would be governed by the same principles of association. That such must have been the origin of spoken language, reason would seem to point out, and the historical investigation of the subject strongly confirms the theory. On the other hand, the language which takes the *eye* for its channel of communication with the mind, would in its first steps be more direct and more simple. The objects of nature and many of the external relations between them were easily represented to the eye with more or less rudeness, by a stick upon sand, and by many other means of graphic imitation which even the savage may command. Yet when we compare these two modes of language with one another, we shall soon perceive that *sound* is a more convenient medium of ordinary communication, if it be only for the reason that the voice is ever with us, and that the ear is ready to receive impressions from every direction, above, below, and around us. A deaf and dumb savage who should wish to depict to a friend an object upon the sand must first catch the attention of his companion by the sense of touch, just as in modern manufactories where the speaking-pipe is used, a bell is attached to it, the ringing of which first directs the party who is to be addressed to apply his ear to the other extremity of the pipe. The result of a comparison then between these two forms of language may, perhaps, be fairly stated thus. The language of pictorial symbols is more easily invented and understood at first. The other, when once invented and understood, is better adapted for the ordinary uses of life. The difficulty of invention, however, is a difficulty that occurs but once; the difficulties in the after use of the language, such as they are, never cease. In the last place, sound travels without the aid of light. It is therefore natural to conceive that oral language would approach a comparatively perfect form with much greater rapidity than that which addresses itself to the eye.

But the time would soon come when it would be desirable to record for a shorter or longer time the acts and thoughts, and commands and duties of man; and here the language of the voice would utterly fail, while the other might ensure a continuance of existence, depending upon the nature of the material on which the representation might be made. In less than a second the sound of the human voice dies away, but the picture even on the sea-sand lasts until the next tide washes it away; the waxen tablet would preserve its characters long enough for the purposes of epistolary communication; the papyrus, the cloth of linen and cotton, the bark of trees, the harder woods, the skins of animals, would retain the impressions upon them for centuries; and lastly, bricks, and stone, and metal, under favourable circumstances, might convey their records to a posterity of many thousand years. Now to represent visible actions and visible objects would, as we have already stated, be an easy affair, and the signs for abstract qualities might be obtained, as in sounds, upon the principle of association. But instead of forming a new series of associations, which would not easily become generally intelligible, it would no doubt be found more convenient, occasionally, to turn to account the already existing language of sound. A few examples may perhaps explain our meaning. Visible objects, in the first place, may be directly represented. No pictorial symbol of an *ox* can so readily convey that notion to the mind as the representation of the animal itself, or, in order to save time, that part of the animal which is most characteristic of it might, and would, be selected; in the present case we should propose the head of the animal with its horns. To signify a visible action, such as *fighting*, we should, perhaps, avail ourselves of the *fist*, as the natural organ for that purpose belonging to man, following therein the same direct principle of association which has formed the Latin word *pugnare*, to fight, from the element *pugnus*, or rather *pug*, a fist. In this way we should form a series of symbols altogether independent of the language of sound; but we repeat, it would often be more convenient to make the language of visible signs in part dependent upon the oral symbols. This may be most simply effected by what is in fact a species of punning: If, for instance, a symbol were required of an Englishman for the abstract notion of *friendship*, he might employ the two separate signs for a *friend* and a *ship*; the first of which we will suppose to be *two hands clasped*, the other, of course, *a hull with a mast* and enough *rigging* to distinguish it from other objects. We should thus have two pictorial symbols, which would separately excite in the mind first the *notions*, and then the oral names of *friend* and *ship*, and the combinations of these sounds would recall that new notion, for which the articulate sounds of the word *friendship* are already the conventional symbol. Books of amusement for children have been formed upon this principle, and we have seen in them such a sentence as—*I saw a boy swallow a gooseberry*—formed by uniting the pictures of an *eye*, a *saw*, a *boy*, a *swallow*, a *goose*, and a *berry*.

So far we have only considered what the origin of written language might have been. The records still existing of the Egyptians have enabled modern discoverers to deduce with an evidence closely approaching to certainty what it actually was. The hieroglyphic characters of Egypt bear upon the very face of them decided proof that they are in their origin pictorial emblems; and that they constitute a language, appears incontrovertibly from the triple Rosetta inscription, the Greek version of which expressly affirms, that the decree contained in the inscription was ordered to be written in three different characters; the sacred letters, the letters of the country, and the Greek. The second of these classes has been called the *enchorial*, from the Greek term (ἐγχώριος) signifying *of the country*, or else *demotic*, (δημοτικὸς) i. e. *of the people*. But although the hieroglyphic characters may be for the most part pictorial emblems used directly for the objects which they represent, or metaphorically for other associated ideas, it has been established by most satisfactory evidence, that they were also in some cases representatives of articulate sound, not, however, of the whole oral name belonging to their original object, but solely of the initial letter, or perhaps syllable. This use of the sacred pictorial characters as symbols of sound was perhaps originally confined to the expression of proper names. Such, for instance, is their use in the hieroglyphic division of the Rosetta inscription for the name of Ptolemy and in another inscription for that of Cleopatra. Thus, the former name might be expressed hieroglyphically in our own language by the pictures of *a pig*, *a top*, *an owl*, *a lion*, and *a mouse*. It should be added, however, that when the sacred symbols are used with this phonetic or vocal power for royal names, they are included in an oval ring or cartouche. The enchorial character seems at first to bear little or no resemblance to the hieroglyphic; but a comparison of various manuscripts that have been found in mummies, containing parallel passages in the two characters, has led to the certain conclusion that the enchorial themselves have arisen from the degradation or corruption of the sacred pictorial characters. Dr. Young, in his excellent article on Egypt, in the Supplement to the *Encyclopædia Britannica*, has given specimens which are perfectly sufficient to establish the connexion. The subject, however, of Egyptian writing in its different forms requires an investigation of so many details, that we must refer our readers to HIEROGLYPHICS. We must here be satisfied with stating what appears to us to be a safe conclusion, that a language originally hieroglyphic, would naturally wear away until the characters lost nearly all trace of their original formation on the one hand, and became, eventually, the mere representatives of phonetic powers, first, perhaps, as syllables, afterwards as mere letters.

The Hebrew alphabet again affords double evidence of the same nature. The names of the letters, it is well known, are also the names of material objects, some of the very objects, in fact, which would be well adapted to pictorial representation. A part of these names, it is true, are obsolete in the Hebrew language as at present known, *i. e.* the authority for their meaning is solely traditional, as they are not found in the existing writings of the language; but this fact, while it affords evidence that the names are not the result of forgery, is precisely what must necessarily have occurred in those changes to which all language is exposed in the long course of ages. We have given a table with the Hebrew names of the letters, which it will be seen have been borrowed, with slight changes, for many other alphabets. But it will be objected that, in fact, the letters, whatever they may be called, bear no pictorial resemblance to the objects which it is pretended they represent. If the Hebrew characters alone be considered, this objection will not be unreasonable. But there is strong reason for believing that the present Hebrew characters are of comparatively modern date, and if so, there is nothing very violent in the supposition that they may have been derived by degradation from an earlier pictorial form, as the enchorial of the Egyptians, it is now established, arose from the corruption of their hieroglyphics. But not to rely too strongly upon theory, we may appeal to what are virtually *Hebrew* alphabets, though called Phenician and Samaritan. In Plate I. (p. 382) Nos 2, 3, 4, 5, the reader will see specimens of these alphabets. The first two are taken from Boeckh's *Inscriptions*, pp. 523, 527, and from the coins given by Mionnet. The Samaritan characters are taken solely from Mionnet. Now among these, we find a few at least, which, even to the sober minded, bear considerable resemblance to the natural objects. The first letter in these alphabets, *aleph*, it is well known means an *ox*; indeed, the terms ἐλέφας, *elephas*, *elephant*, of the Greek, Latin, and English languages, seem to be derived from this Hebrew name. If in Syria the name *aleph* was extended to the *elephant*, just as the Greeks applied their term *crocodile*, properly a *lizard*, to the monster of the Nile—when the word came to the western nations in connection with the *elephant*, the original sense would be readily lost in the secondary. The Romans too called the same animal *Bos Lucas*, the *Lucanian Ox*. We have already stated that the most simple mode of representing an ox would be by a picture of its head and horns, and if any one will turn the engraving of our second Phenician character, so as to have the angular point downwards, he will see a very fair picture of an ox's head, with its two horns, and ears into the bargain. Those who are determined to take nothing for a representative of an ox that has not a body, four legs, and a tail, may be asked to account for the astronomical figure of *taurus* in the zodiac.

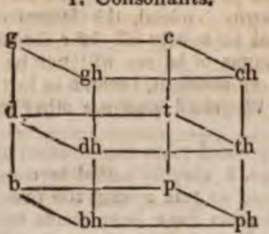
Again the Hebrew name for the letter *m* was *mem*, and this also was the name for water. Now a very ordinary symbol for water is a zigzag line, which is no doubt intended to imitate undulation or rippling. We find this symbol for *aquarius* in the zodiac, and we find it also in Greek manuscripts, both for θάλασσα the sea, and ὕδωρ water, the former word having the symbol inclosed in a large circle or *theta*, the latter having its aspirate duly placed above the waving line. Indeed every boy in his first attempt to draw water, represents it by a zigzag line. But before we point out in the written characters what we look upon as representing the wave, or (to be candid) as being the corrupted remains of what once was a wave, we must premise a few words on the characters of the older Western languages. We have already asserted our belief, that the Hebrew characters now used are of more recent form than those in the Phenician and Samaritan alphabets—we will now go one step farther, and express our opinion, that in many of the characters, the Greek alphabet and the Etruscan (which, notwithstanding its independent name, is a mere offset from the Greek) generally present a more accurate picture of the original letters than those of the three former alphabets. That all these alphabets are identical in their origin, we will presently show in more detail. It is enough here to rely upon the evidence of Herodotus, (v. 58) who expressly affirms (and he speaks from his personal examination) that the Ionians received their characters from the Phenicians, and that they were actually called Phenician. Now, there is no doubt that the inscriptions from which we have taken the Greek characters of our plate, are older, at least, than either the Phenician inscriptions given in Boeckh, or the coins which furnished Mionnet with his characters. Hence, we may naturally expect to find at times in the oldest Greek characters traces of a higher antiquity and purer forms than in those which pass under the more venerable names of Hebrew, Phenician, and Samaritan. The mere wave, then, we contend, was probably the original form of the *mem*: the initial or concluding stroke of the wave becoming, by a kind of flourish, longer than the others, leads to the so-called Etruscan and Greek forms in columns 6, 9, 14, 15, 16, 18. This long descending stroke takes a bend in the Samaritan and Hebrew characters towards the left; as was not unnatural in a language where the words run in that direction. By a comparison of the *gimel*, *nun*, *ayin*, and *pe*, and perhaps *caph*, with the corresponding letters in the other alphabets, the reader will perhaps be induced to ascribe the bottom strokes, which in these letters also run to the left, to the same accidental origin. This supposition is strongly confirmed by the fact, that the *caph*, *nun*, *pe*, and *tsadi*, when they are the final letters of a word, omit this appendage, and in its place have the perpendicular stroke merely continued in the same direction downwards, a little beyond its usual length. Our last example shall be from *ayin*, which is at once the name of a letter and the word which signifies an *eye*. The eye happens moreover to be an hieroglyphic character of the Egyptians, and, therefore, we cannot be surprised to find it among the Hebrew symbols. Nay, if we may believe Champollion, the picture of an *eye* in the Egyptian hieroglyphics was actually used at times for an *o*, exactly as *ayin* by the Hebrews. Now, though an eye might be represented at first with tolerable precision, it would, in the inevitable course of degradation, soon become a mere oval, or rather circle (for the eyes of animals are generally circular) with a small dot in the centre to mark the pupil. Such a character is actually found in our Greek series of alphabets, Plate II, Column 21, &c. The form afterwards lost its inserted point, and at times was corrupted into a lozenge or even a triangle. In Dr. Young's successive plates of parallel passages from Egyptian MSS. (*Encycl. Brit. Supp.* Pl. 78. N.) the reader may see an emblem, consisting, like our own, of a circle with a point in it, gradually wearing down in MSS. less and less carefully written, until it becomes at first a mere circle, and then something more like a triangle. After what has been said, we need hardly repeat that the Hebrew form appears again in a very corrupted state. A tail has been added, upon the principle explained above, and the careless writer (as in the Greek letter, Plate II, Column 20) has failed to make his circle meet at the top, an accident which may be also traced in the Hebrew *theth*. Indeed, the letters *ayin* and *theth* may be compared in nearly all their forms. Those who examine the changes of letters, will not be surprised, that what was at first an accident, became at last a fixed rule in the formation. We shall soon see other instances of this fact.

But before we proceed to an examination of the alphabets given in our plates, it may be useful to consider the distribution of articulate sounds among the vowels, liquids, and consonants. Attempts have been made by some writers to determine the number of distinct sounds which the human voice is capable of producing. A little consideration would have shown them, that they were attempting to limit that which was essentially infinite. The vowel sounds all run into one another in a continuous gradation. The same is true of those modifications of sound which we call consonants, and likewise of the liquids. At the same time it is, of course, necessary that a limited number of symbols should be employed. Of these some nations will employ more, some less, but few have ever made use of so many as thirty, unless, indeed, we include those alphabets which consist of syllabic symbols, and then, of course, the consonantal syllables will be multiplied in the proportion of the simple vowels. The vowel sounds are usually placed in the order, *a*, *e*, *i*, *o*, *u*, such being their succession in the various alphabets of Europe and Western Asia; but if we wish to place them in that order, which marks their relation to one another, we should write *i*, *e*, *a*, *o*, *u*, or in the opposite order *u*, *o*, *a*, *e*, *i*. Mr. Willis, in a paper in the *Cambridge Philosophical Transactions*, has shown by experiment, that the different vowel sounds may be produced artificially, by throwing a current of air upon a reed in a pipe, and that, as the pipe is lengthened or shortened, the vowels are successively produced in the order above given. When a door creaks, or a cat squeals, we have experiments of the same nature, at least as regards the result, for in both these cases we may often detect the due series of the vowels. Thus, the word *mew* would be more expressively written *mieaou*. In all these remarks we speak of the vowels as possessing those sounds which are common on the continent, not those which are peculiar to ourselves; viz., *i* like *ee*, *e* like *ay*, *a* as in *father*, *o* as in *bone*, *u* as *oo* in *food*.

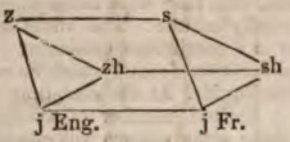
The liquids again should be written in the order *r*, *l*, *n*, *m* beginning from the throat and advancing along the palate and teeth to the lips; or in the reverse order. The other letters have often been divided according to their organs: 1st. the guttural and palatals, *g* (as before *a*), *k* (with *c q*); *gh*, *ch* (as in the Scotch *loch*): *h*, with perhaps *ng*, *y*, and *wh*. 2ndly, dentals, *d*, *t*; *dh* (as *th* in this), *th* (as in *thing*); *z*, *s*; *zh*, (like *ch* in *church*), *sh*; *j* (as in English), *j* (as in French). 3rdly, labials, *b*, *p*; *v*, *f* and *w*. Perhaps the four last of those we have included among the dentals partake in an equal degree of the palatal character. In the above enumeration of the consonants, we have placed first in their respective series, those commonly called the middle (or medial) letters *g*, *d*, *b*; then the *tenues*, or more delicate letters *k*, *t*, *p*; and then the aspirates; but as each class presents two forms of the aspirate readily distinguished by the ear, and as these pairs of aspirates stand in the same relation to one another as the *medial* and *tenues*, we have throughout placed what we may perhaps call the middle aspirate before its delicate relative, viz., *gh* before *ch*, or χ; *dh* before *th*; *v* before *f*. Perhaps among the labials, *v*, *f*, *w*, may be considered as aspirates: if so, they are still in their proper order. So among the six sibilants given after the dentals, it appears to us, that *z*, *ch*, and the English *j*, stand respectively to *s*, *sh*, and the French *j*, in the same relation of *medials* to *tenues*, and they are arranged accordingly. The letters *y* and *w* are *sui generis*, and are, indeed, intimately related to the vowels, having an affinity to the opposite extremities of the vocal series, *y*, *i*, *e*, *a*, *o*, *u*, *w*; and thus we may consider the commencement of the series as connected with the throat, and the termination with the lips.

A tabular arrangement, in which the *medial*, *tenues*, and *aspirated* letters are placed in vertical columns, while those belonging to the same organ are collected in horizontal rows, affords a good view of them. But the parallelopipedon furnishes an arrangement superior to that of the square for the twelve related consonants given below; and for the sibilants, the angular points of the prism may be employed; while the vowels and liquids require nothing more than a simple line.

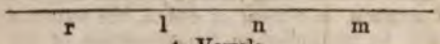
1. Consonants.



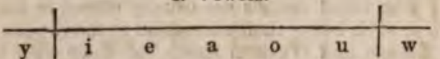
2. Sibilants.



3. Liquids.



4. Vowels.



In the preceding parallelopipedon, the three horizontal planes, beginning from above, represent the guttural or palatal, the dental, and the labial letters. The front vertical plane includes the aspirates, that at the back, the non-aspirates. The left vertical comprehends the medial letters, that on the right the *tenues*. Every letter is, of course, at the intersection of three of these planes, and may be defined accordingly.

A distribution of the letters according to the actual nature of the sounds is of considerable use in the examination of those numerous euphonic and dialectic changes which occur not only in the polished language of Greece, but also in those languages which are inconsiderately called barbarous. But no single distribution will at once present to the view all the relations of the different letters. Not merely are the several letters in each of our horizontal, and to a certain extent also in the vertical, divisions interchangeable with their neighbours, but the twelve consonants arranged in No. 1. are in fact also related to the liquids, and even to the vowels. As these consonants extend from the throat to the lips, so do the liquids, and the vowels also, *y* and *i* being formed in the back of the mouth, *u* and *w* at the lips. In fact, the principle of lengthening the vocal pipe, which gave Mr. Willis the series of vowel sounds, is nothing more than what is done in the human mouth. To produce the first sound, we shorten the tube of the mouth; for the last, we extend it to its utmost length; and in intermediate degrees for the vowels between the two extremes. In comparing, therefore, our ordinary consonants with the liquids and vowels, we find, as we might expect, *g* closely related to *y*, as our language in its older forms, and even its existing dialects, fully establishes. The intermediate *d* again has an affinity for *l*, *n*; and *b*, at the labial extremity of the consonants, is intimately related to *m*, *w*, and *u*, at the corresponding points of the other series. To make our views include the whole body of letters, it remains to be observed in the first place, that had the nasal organ been considered, we should have had a series *m*, *n*, *ng* with their intermediate sounds depending partly upon the nose, and partly upon the lips, teeth, and palate, respectively. In the Sanscrit alphabet, the series of guttural, palatal, lingual, dental, and labial consonants, have an *n* belonging to each class with a distinct symbol. That which belongs to the guttural series is a sound analogous to our *ng* in *ringing*. The nasal of the labial series is of course *m*. The other omission of our tabular view is the letter *h*, which, when pronounced at all, is a faint representative of the guttural aspirate *ch*. In the Hebrew alphabet, the names *cheth* and *heth* are given indifferently to the eighth letter, and the etymology of every language would supply examples of the connexion.

Having endeavoured to arrange the letters of the alphabet upon some principle, we cannot pass over in silence the apparent confusion in the alphabets we have been speaking of, the Hebrew and Greek. That the order observed in the latter is borrowed from the former can scarcely admit of a *uestion.* For though the *vau* of the Hebrew has no corresponding character in the later Greek alphabet, it is yet well known that it once had such a correlative in the *digamma*, at least in power; and that the digamma was actually lost from the sixth place is proved from the gap at that point in the numerical use of the Greek alphabet, and the clumsy contrivance of filling it up by the letter ϛ. The position of the letter F in the Roman alphabet is a proof in confirmation. The *tsadi* of the Hebrews can never have had a place in the Greek alphabet, but the following letter *koppa* most assuredly had, as is proved both by the existence of that letter in many of the older Greek inscriptions, and the coins of Croton, and no less decidedly by the insertion, as before, of a numerical substitute, which even retained the name of *koppa*. It may be observed too, that the Latin *q*, of the same power and form, corresponds also in position; and the close connexion between *koppa* and *q* is further confirmed by the fact, that as *q* is generally used solely before *u*, so *koppa* is rarely used except before *o*, as in the coins of Cos, Corinth, and Syracuse. The *schin* and *sin* of the Hebrew have in their own alphabet not merely an identity of form, except in the diacritic points, but bear also the same numerical value, so that they must be considered as one in their origin. At *tau* the Hebrew series terminates, while the Greek adds first a υ, then a φ, a χ, a ψ, and an ω. That some of these did not belong to the early Greek alphabet is proved historically. The ω appears rarely before the year 403 B.C.; ψ, χ, and φ, were represented by ΦΣ, KH, ΠH, and υ or Υ appears to be only a variety of the *ayin*, to which it bears a strong resemblance in form. The letters *o* and *u* moreover in all languages are so closely related in power, that the one might almost supply the place of the other, as is actually the case in the Etruscan, which had a *u*, but no *o*. It is not, therefore, a very bold thing to assert that the early Greek alphabet terminated at the same point as the Hebrew. There is, however, a difficulty which should not be neglected. It has been a common assertion, that the old Greek alphabet consisted of only sixteen letters. But Pliny and Plutarch seem, in the first place, to be the sole authority for the statement; and the assertion of the former, that Palamedes in the time of the Trojan war (!) added Θ, Ξ, Φ, X, and Simonides Z, H, Ψ, Ω, is full of so many difficulties that belief could not readily be given to him, even were there no counter authority. For upon what principle could the Greek letters have attained their present order, if they were introduced according to the chronological arrangement given by Pliny? But fortunately in the very passage of Pliny referred to, (vii. 56, or 57,) he gives another statement from Aristotle, differing from his own in several particulars, but it must be confessed not more satisfactory. They mutually serve, however, to weaken the authority of each other. In enumerating the sixteen letters it may be observed that the long vowels H, Ω, the double letters Z, Ξ, Ψ, the aspirates Φ, X, Θ, are excluded by Pliny. In defence of Ω, Ψ, X, Φ we say nothing; but the character H certainly did exist, not indeed as a long vowel, but as an aspirate. Thus with the *digamma*, the letter H (*cheth*) and the *theta* the old alphabet possessed a complete trio of aspirates: so erroneous is the notion that they should all be excluded. Lastly, as for Z and Ξ, the circumstance of their situation corresponding precisely to the *zain* and *samech* of the Hebrew would induce us to defend them, even at the risk of supposing (if such supposition be necessary) that, in their original power, they were not double letters. We do not, however, mean that the very characters existed, but that sibilants of some kind occupied their places. The precise correspondence of the Greek and Hebrew alphabets in the order and power and names of the letters is an argument of much stronger weight than any testimony from such careless and late writers as Pliny and Plutarch.

But we are digressing too long from the question about the principle which governed the first arrangement of the Hebrew or old Greek alphabet, if principle there be. Though we cannot satisfactorily account for the whole order throughout the twenty-two letters, there are certainly traces of some regularity in the arrangement. We find first the simplest of the vowel sounds followed by the three medials, β, γ, δ; then another vowel, followed, with some irregularity indeed, by aspirates corresponding in order to the above consonants, *vau*, *cheth*, *theth*, no bad representatives of φ, χ, θ. Then again we have a vowel ι, followed soon after by three consonants related to each other, λ, μ, ν. Soon after we find a fourth vowel ο, and after it, in a little disorder it must be allowed, *pi*, *koppa*, *tau*. It cannot well be a mere accident that the several classes of labials, palatals, and dentals occur so nearly together in the different parts of the series, and always in the same order. It will, perhaps, here be observed, that in these remarks we are unintentionally confirming the assertion of Pliny and Plutarch about the sixteen letters, the more so as Plutarch speaks of four quaternions. The objection to such an explanation of their statements is to be found in the difficulty of imagining a language to exist without a sibilant; otherwise the absence of an *r* might readily be supplied by *l*, as is actually the case in some languages. As for the sibilant, however, the *th* might possibly represent that sound.

The accompanying plates require a few remarks in addi-

Coptic.

			Name.	Power.
1	Ⲁ	ⲁ	Alpha	a
2	Ⲃ	ⲃ	Bita or Vita	b v
3	Ⲅ	ⲅ	Gamma	g
4	Ⲇ	ⲇ	Dalda	d
5	Ⲉ	ⲉ	Ei'	e
6	Ⲋ	ⲋ	So	s
7	Ⲍ	ⲍ	Zita	z
8	Ⲏ	ⲏ	Hita	i;
9	Ⲑ	ⲑ	Thita	th
10	Ⲓ	ⲓ	Iauda	ij
11	Ⲕ	ⲕ	Kappa	k
12	Ⲗ	ⲗ	Lauda	l
13	Ⲙ	ⲙ	Mi	m
14	Ⲛ	ⲛ	Ni	n
15	Ⲝ	ⲝ	Xi	x
16	Ⲟ	ⲟ	ŏ	o
17	Ⲡ	ⲡ	Pi	p
18	Ⲣ	ⲣ	Ro	r
19	Ⲥ	ⲥ	Sima	s
20	Ⲧ	ⲧ	Tau	t
21	Ⲩ	ⲩ	He	e
22	Ⲫ	ⲫ	Phi	f
23	Ⲭ	ⲭ	Chi	ch
24	Ⲯ	ⲯ	Psi	ps
25	Ⲱ	ⲱ	O	o
26	Ϣ	ϣ	Shei	sh
27	Ϥ	ϥ	Fei	f
28	Ϧ	ϧ	Khei	kh
29	Ϩ	ϩ	Hori	h
30	Ϫ	ϫ	Janja	j
31	Ϭ	ϭ	Shima	sh
32	Ϯ	ϯ	Dhei	dh

Ethiopian or Abyssinian.

		Name.	Power.
1	ሀ	Hoi	ha
2	ለ	Lawi	la
3	ሐ	Haut	ha
4	መ	Mai	ma
5	ሠ	Saut	sa
6	ረ	Res	ra
7	ሰ	Saat	sa
8	ቀ	Kof	ka
9	በ	Bet	ba
10	ተ	Tawi	ta
11	ኀ	Hharm	hha
12	ነ	Nahas	na
13	አ	Alph	a
14	ከ	Caf	ca
15	ወ	Waw	w
16	ዐ	Ain	a
17	ዘ	Zai	za
18	የ	Yaman	ya
19	ደ	Dent	da
20	ገ	Gheml	ga
21	ጠ	Tait	tha
22	ጰ	Ppait	ppa
23	ጸ	Tzadi	tza
24	ፀ	Zzappa	zza
25	ፈ	Af	fa
26	ፐ	Psa ?*	pa ?

Additional Amharic Letters.

ሸ	sha
ቸ	tja
ኘ	nja
ኸ	kha
ዠ	ja
ጀ	dja
ጨ	tsha

Moeso Gothic.

		Power.
1	𐌰	a
2	𐌱	b
3	𐌲	g
4	𐌳	d
5	𐌴	e
6	𐍆	f
7	𐌾	g or y
8	𐌷	h;
9	𐌹	i
10	𐌺	k
11	𐌻	l
12	𐌼	m
13	𐌽	n
14	𐍉	o
15	𐍀	p
16	𐌵	q
17	𐍂	r
18	𐍃	s
19	𐍄	t
20	𐌸	th
21	𐌿	u
22	𐍈	cw or c
23	𐍅	w
24	𐍇	ch or x
25	𐌶	z

Russian.

	Antient.	Modern	Name.	Power.
1	А	А	As	a
2	Б	б	Booke	b
3	В	В	Vadi	v *or* f
4	Г	Г	Glaghol	gh
5	Д	Д	Dobre	d
6	Є	Е	Yest	e *or* ye
7	Ж	Ж	Sevetie	g
8	Ѕ	Ѕ	Zelo	z ?
9	З	З	emla	z
10	И	И	Ische	I *or* e
11	І	і		i *or* e
12	К	К	Kake	k
13	Л	Л	Liudi	l
14	М	М	Missal	m
15	Н	Н	Nash	n
16	О	О	On	o
17	П	П	Pokoi	p
18	Р	Р	Rtse	r
19	С	С	Slovo	s
20	Т	Т	Twerdo	t
21	Ѵ	У	Eck	oo
22	Ф	Ф	Phert	f
23	Х	Х	Kher	kh
24	Ц	Ц	Tse	ts
25	Ч	Ч	Tschert	tsch
26	Ш	Ш	Sha	sh
27	Щ	Щ	Stsha	stsh
28	Ъ	Ъ	Yer	
29	Ы	Ы	Yeri	ui
30	Ь	Ь	Yeer	o
31	Ѣ	Ѣ	Yat	ye
32	Є	Э	Kse ?	x ?
33	Ѯ	Ю	Kse	x
34	Ѱ	Я	Pse	ps
35	Ѳ	Ѳ	Thita	th
36	Ѵ	Ѵ	Ischicze	v

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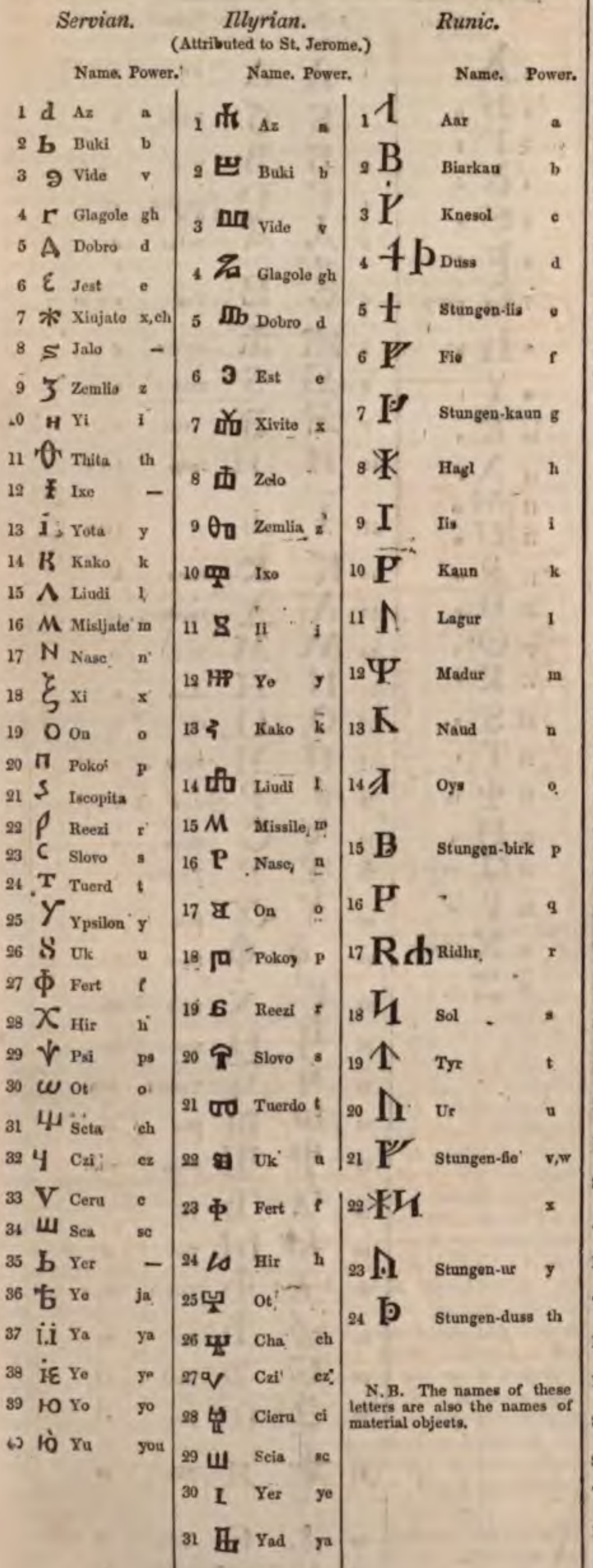
* The name of the 26th letter, and also its power, seem open to doubt, as the use of the same character in the letters 31—36 appears to imply that it has the sound of *ja*, or something similar. The Ethiopic is a syllabic alphabet, and it has a system of additional marks or modifications of the letters, marking a change of vowel, not unlike the points of the Hebrew. We have not thought it necessary to insert these.—*See* Ludolf.

tion to what has been already said. The first plate contains alphabets running from the right to the left, a practice which seems to have been earlier than that which is now generally adopted. Herodotus tells us, (II. 36.) that such, too, was the practice of the Egyptians, and his assertion is confirmed by a considerable number of the existing inscriptions, among which, however, some are found running in the opposite direction, and still more arranged vertically. The Etruscans, it is well known, turned their letters to the left, and there even exist specimens of Latin inscriptions with the same peculiarity. Among the Greeks, there were four modes of writing, one vertical (*κιονιδὸν* or *column-wise*), and three horizontal, *viz.* one with the words running to the left; another, which soon prevailed over the rest, turned towards the right; and a third, in which the direction of the lines alternated, as in the course of a plough, from which idea, inscriptions of this kind are said to be written *βου-στροφη-δον*, or *ox-turning-wise*. This last method must have been much more convenient than our present broad sheet of letter-press, in which the eye, on arriving at the end of a line, requires a nice perception of a straight line to hit the commencing point again. The second and third plates give numerous specimens of the Greek alphabet, which are taken chiefly from Boeckh's great work, now in progress at Berlin, and the numbers written after the titles at the head of each column refer to the order of the inscriptions in that work.

The several inscriptions which have furnished these alphabets exist in the following forms:—

No. 14. In two flutings of a Doric column brought from the island of Melos, now in the Nanian Museum—No. 15. On a bronze tablet found in 1783 in Italy near Petilia, north of Policastro: it is in the Borgian Museum at Naples—No. 16. On a vase discovered in a sepulchre near Corinth. (See Dodwell, ii. 196.)—No. 17. On a votive



Servian.

	Name.	Power.
1	Az	a
2	Buki	b
3	Vide	v
4	Glagole	gh
5	Dobro	d
6	Jest	e
7	Xiujate	x,ch
8	Jalo	—
9	Zemlia	z
10	Yi	i
11	Thita	th
12	Ixe	—
13	Yota	y
14	Kako	k
15	Liudi	l
16	Misljate	m
17	Nasc	n
18	Xi	x
19	On	o
20	Poko	p
21	Iscopita	
22	Reezi	r
23	Slovo	s
24	Tuerd	t
25	Ypsilon	y
26	Uk	u
27	Fert	f
28	Hir	h
29	Psi	ps
30	Ot	o
31	Scta	ch
32	Czi	cz
33	Ceru	c
34	Sca	sc
35	Yer	—
36	Ye	ja
37	Ya	ya
38	Ye	ye
39	Yo	yo
40	Yu	you

Illyrian.
(Attributed to St. Jerome.)

	Name.	Power.
1	Az	a
2	Buki	b
3	Vide	v
4	Glagole	gh
5	Dobro	d
6	Est	e
7	Xivite	x
8	Zelo	
9	Zemlia	z
10	Ixe	
11	Ii	i
12	Yo	y
13	Kako	k
14	Liudi	l
15	Missile	m
16	Nasc	n
17	On	o
18	Pokoy	p
19	Reezi	r
20	Slovo	s
21	Tuerdo	t
22	Uk	u
23	Fert	f
24	Hir	h
25	Ot	
26	Cha	ch
27	Czi	cz
28	Cieru	ci
29	Scia	sc
30	Yer	ye
31	Yad	ya
32	Yus	yu

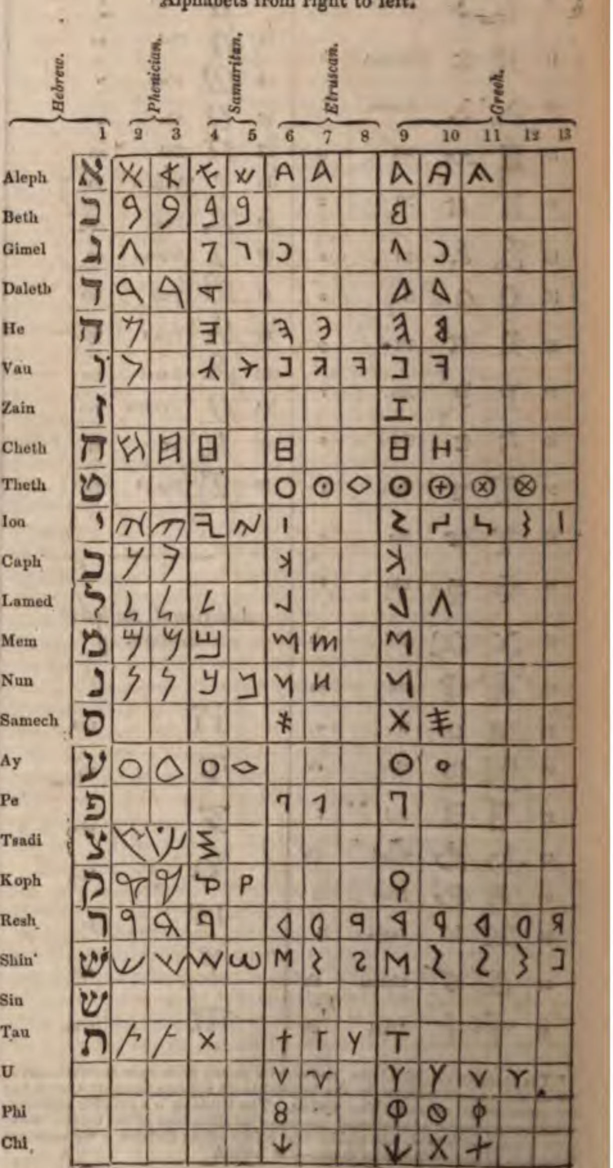
Runic.

	Name.	Power.
1	Aar	a
2	Biarkau	b
3	Knesol	c
4	Duss	d
5	Stungen-iis	e
6	Fie	f
7	Stungen-kaun	g
8	Hagl	h
9	Iis	i
10	Kaun	k
11	Lagur	l
12	Madur	m
13	Naud	n
14	Oys	o
15	Stungen-birk	p
16		q
17	Ridhr	r
18	Sol	s
19	Tyr	t
20	Ur	u
21	Stungen-fie	v,w
22		x
23	Stungen-ur	y
24	Stungen-duss	th

N.B. The names of these letters are also the names of material objects.

PLATE I.

Alphabets from right to left.


Hebrew.
Phœnician.
Samaritan.
Etruscan.
Greek.
1
2
3
4
5
6
7
8
9
10
11
12
13
Aleph
Beth
Gimel
Daleth
He
Vau
Zain
Cheth
Theth
Ioa
Caph
Lamed
Mem
Nun
Samech
Ay
Pe
Tsadi
Koph
Resh
Shin
Sin
Tau
U
Phi
Chi

helmet found in the Alpheius—Nos. 18, 19. On a marble, now in the British Museum, No. 199—No. 20. On a square marble base, near a temple of Apollo, in the island of Delos. (See Tournefort's *Travels*, t. i. ep. vii. p. 360.)—No. 21. On a bronze tablet dug up at Olympia and brought away by Gell in 1813—No. 22. On a bronze helmet found in 1817, in the ruins of Olympia, in the possession of Col. Ross—Nos. 23, 24. Found at Delphi. (See Dodwell, ii. 509.)—No. 25. On a small votive helmet found near Olympia, in the possession of Col. Leake—Nos. 27, 28. Part of a hymn to Bacchus inscribed on an altar, which contains also a representation of a procession in honour of the god, in the Pembroke Museum at Wilton.—No. 29. From an epitaph in elegiac verse on those who fell in the first battle before Potidæa, B.C. 432. (Thucydides, i. 62.) It was found in the plain of the Academy near Athens, and is now in the British Museum, No. 290—No. 30. The alphabet here given is that which came generally into use at Athens after the archonship of Euclides, 403 B.C. Specimens may be seen in the Elgin marbles of the British Museum, for instance in No. 305, the date of which is said to be 398 B.C.

The column No. 26 is from Mazocchi's folio on the Heraclean tablet. The Codex Alexandrinus, No. 36, is in the British Museum. [See ALEXANDRINE CODEX.] The fourth plate relates to the Roman alphabets, including, however, what are often called, but without good reason, Saxon alphabets. These last characters were undoubtedly employed in writing Saxon, but they were the ordinary characters used during the same period for Latin, and were, indeed, thence borrowed for the former language; their identity besides, with the preceding Roman letters, is very evident. Such of the Saxon characters as were not common to the Latin are placed below plate 4. The other alphabets have their names affixed, and also the titles and powers of the letters. The Coptic, Russian, Servian, Mœsogothic are evidently derived, with some exceptions, from the Greek; and the same is perhaps true, in a great measure, of the Ethiopic, Illyrian, and Runic.

In passing the eye along the various forms which the several letters have assumed, we shall see a strong similarity running throughout—from the Phenician through the Greek and Etruscan to the Latin; and nearly all the differences which do exist admit of explanation, if a few points be taken into consideration. The form of a letter must, in the first place, depend much upon the nature of the material upon which it is written, and of the instrument employed. On hard substances where incisions are to be made, straight lines will naturally prevail. When the letter is merely painted or inscribed upon a very yielding material, two or more inclined lines are apt to degenerate into a single curve.

PLATE II.

Greek Alphabets.

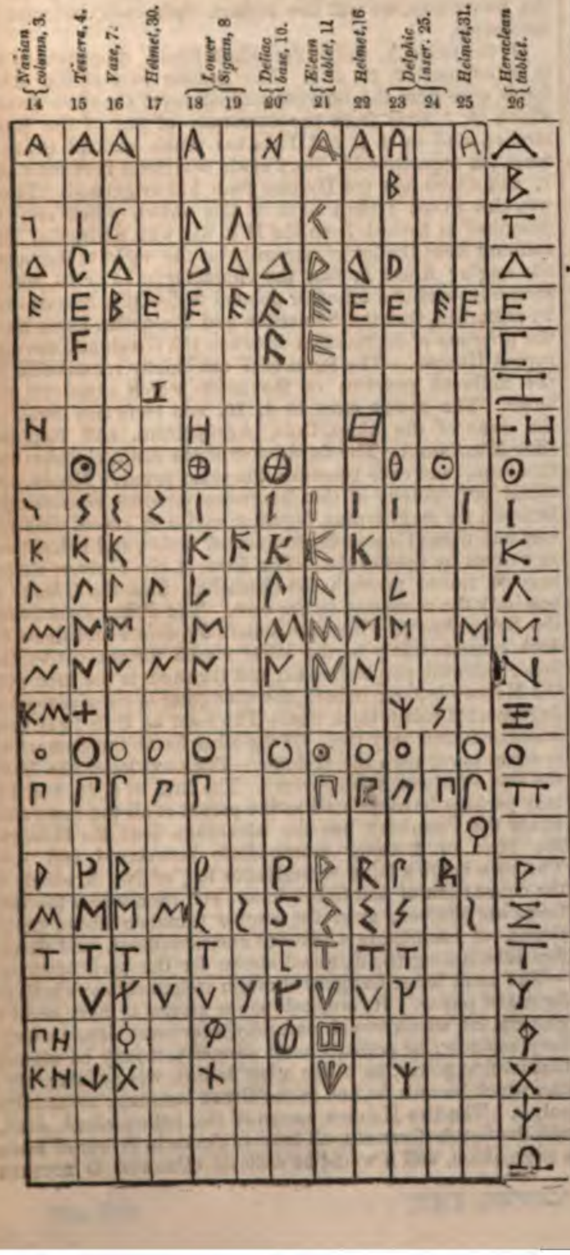
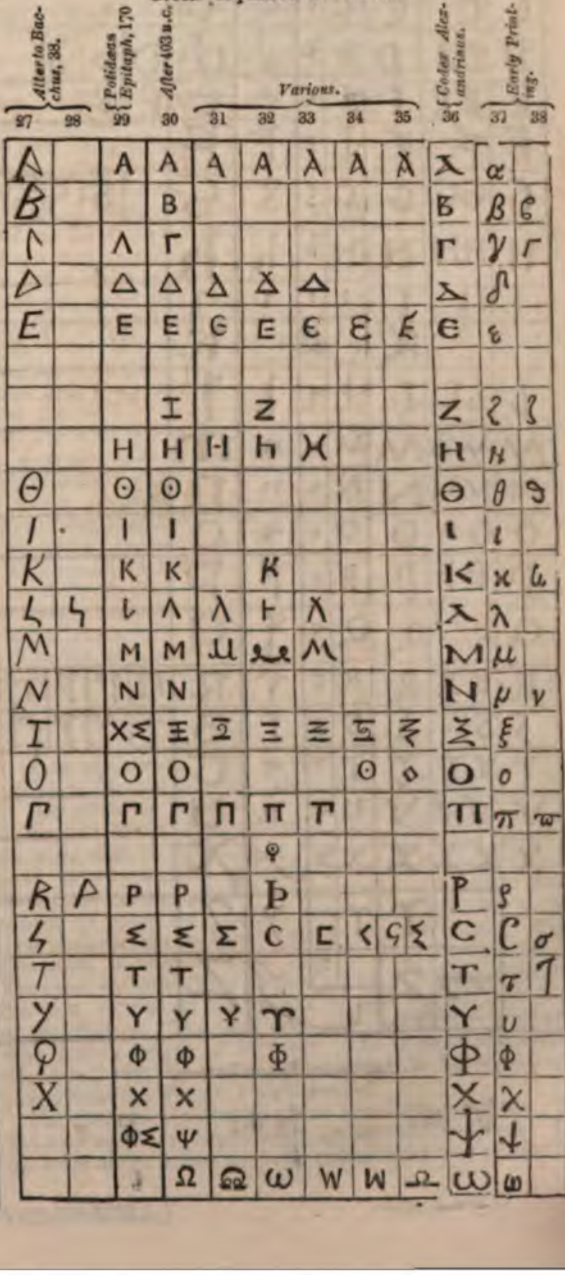

Naxian column, 3.
Tessera, 4.
Vase, 7.
Helmet, 30.
Lower Sigeum, 8
Deliac base, 10.
Elean tablet, 11
Helmet, 16
Delphic inscr. 25.
Helmet, 31.
Heraclean tablet.
14
15
16
17
18
19
20
21
22
23
24
25
26

PLATE III.

Greek Alphabets continued.


Altar to Bacchus, 38.
Potidæan Epitaph, 170
After 403 B.C.
Various.
Codex Alexandrinus.
Early Printing.
27
28
29
30
31
32
33
34
35
36
37
38

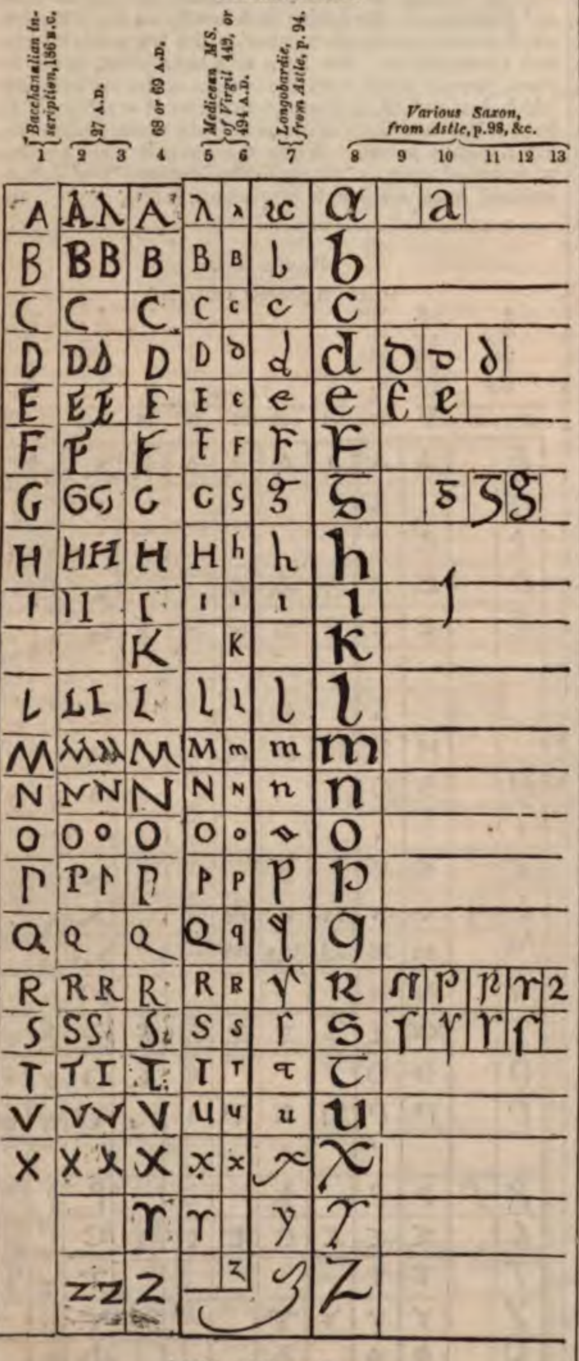
Compare the forms of γ (the third letter) in columns 16 and 21; of δ (fourth letter) in 21, 23, and the Latin *D*; of ϵ (fifth letter) in 30, 33, and 34; of μ in 30 and 32; of π in 30, and the Roman *P* in 1, 2, 3, 4; of ρ in 20 and 21; of σ in 31, 32, and 33; of our own *u* and *v*, both derived from the same Latin character, &c. Again, in incisions the different lines which constitute a character will be generally of uniform thickness, but when a split reed or quill is employed, the strokes in one direction will be thick, in the other fine. Such has clearly been the origin of the existing Hebrew forms. A principle of corruption, not less powerful, is the desire of rapidity, which is most readily obtained by connecting the different parts of a letter together, so that the whole may be produced by one movement of the instrument, or, more strickly speaking, without raising the instrument from the surface. Thus the ϵ in 30 seems to be made by four separate strokes, such is certainly the case with the Roman letter in column 3; but that in 33 requires only two movements, and that in 34 but one. In the same way may be compared the forms of η in 36 and 37; of ξ in 30, 33, 35; of ϖ in 37 and 38; of τ in 36 and 37, &c. But there may be several ways of effecting this object; a letter moreover may be commenced at different points, and hence arise double or more forms for the same letter, even at the same period: compare β in 37 and 38; ϵ in 34 with our own small running *e*, &c. This principle of rapidity carried a step farther leads to the connexion of successive letters. In this way are formed what are called the cursive letters, which run on in continuous succession. Such modes of writing were no doubt common in very early times; and as regards the Romans, we are not left to mere conjecture, as the British Museum contains an inscription of the kind on papyrus, which is referred to the second or third century. Lastly, a fanciful love of variety shows itself in all the works of man, and in none more than the arbitrary variations of letters, particularly those at the beginning and end of words. These several causes of change were more active, when nearly all writings were produced by the pens of individual writers. In modern times, the art of printing has tended strongly to create a unity of form, and will be the best protection against future change.

Having spoken thus generally of the alphabets given in the four plates, we will now remark upon each character in succession.

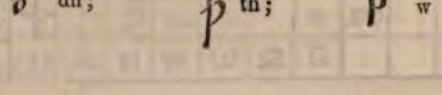
Of the letter A, one of the oldest forms, it appears to us, is in column 10, 25, or 3. The greater part of the other forms arise from the different inclinations of the cross stroke, which in 7 runs from the extremity of one of the main strokes, and in 2, 4, and 11 is too much inclined even to meet the opposite side. No. 2 again is a mean between 4 and 1, and shows how the Hebrew form has originated. There was also an old Italian form of this vowel, which may be described as formed from the Π in 31, with a diagonal line running from the lower extremity on the right to the opposite angle; it was in fact the character in 14 or 16, with a square instead of a round or pointed top.—Of B it need only be remarked, that the Samaritan and Phenician forms show the progress of degradation between the Greek and the corrupted Hebrew.—The forms of Γ are chiefly remarkable for the different positions of the angle which constitute the letter. The round form in 6, 10, and 16 is also found in the coins of the cities Gela, Agrigentum, and Regium. (See MIONNET.) The third letter of the Latin alphabet has this form, and once possessed the same power. Hence, the oldest orthography of that language presents *macistratus*, *leciones*, for *magistratus*, *legiones*, and it is known that the common name *Caius* was pronounced *Gaius*, and indeed was so written by the Greeks.—The form of the Hebrew *daleth* may be traced through the Samaritan from the Greek, in precisely the same way as the *beth*. The difference between the Samaritan or Phenician letters for *daleth* and those for *beth* consists solely in the lower stroke thrown out by the latter from the perpendicular, and the same is the case with the Hebrew letters; in both, the triangular or circular top has degenerated into a thick line.—The form of E in 10 is very anomalous and very rare. Of the other forms the Samaritan is again purer than the Hebrew.—The next letter has been the subject of much controversy. The form in 8, 10, and 15, may perhaps be considered as the parent of all the rest; and again the Phenician has the advantage over the Hebrew, the form in 2 being intermediate between 4 and 1.—The *zain* bears a faint resemblance to ζ of No. 9, which is the oldest form of that Greek letter, and from which the late forms are derived, upon the simple principle above mentioned, of completing a letter at one movement, and therefore substituting the diagonal stroke for the perpendicular.—The next letter has gone through violent changes both in form and power. Its original power seems to have been a guttural *ch*, which would naturally wear away into an ordinary aspirate; or perhaps more correctly, it may be stated, that its first power, as in the other letters, was syllabic, viz., *che*, which became *he*, and in the Greek language eventually only *e*. The two Hebrew names of the letters *cheth*, *heth*, and the Greek form *eta*, all bear evidence in favour of such a supposition, and it would be difficult otherwise to account

PLATE IV.

Roman Letters.


Bacchanalian inscription, 186 B.C.
27 A.D.
68 or 69 A.D.
Medicean MS. of Virgil 449, or 494 A.D.
Longobardic, from Astle, p. 94.
Various Saxon, from Astle, p. 98, &c.
1
2
3
4
5
6
7
8
9
10
11
12
13

Additional Saxon Letters.



for the singular fact, that the same character H was at one time the Greek representative of an aspirate, afterwards of an initial *he*, and finally of a long *e*. In No. 26 of Plate II. H is the long vowel *ē*, and so in 30 of Plate III. and those which follow. In all the others which precede, it is an aspirated consonant. With regard to the various forms, the character in 3, 4, 6, 9, 22 being supposed to be the purest, No. 2 is half-way between the Hebrew on the one hand, and 18 on the other. But the Greek form did not stop here. When the letter H was appropriated as a vowel, the aspirate gradually lost its second pillar, until at last it appeared in the first of the two forms given in the Heraclean tablet, the second in that column being, as we have just stated, the representative of the long vowel. This form of the aspirate appears in many manuscripts above the initial letter of the word, but was eventually further corrupted into a mere comma, thus (‘). There exists, it should be stated, a story, that the Greeks derived their aspirate in a mode somewhat different from the above statement. The letter H, we are told, was cut into two parts, each consisting of a pillar and half the cross stroke; the first half being employed as an aspirate, the second as what they call a soft breathing, by which is meant simply the absence of an aspirate. A character to denote the absence of a sound is, it has been justly remarked, something new in alphabetic writing; and, in fact, it is now a common belief, that the soft breathing and its supposed representative are the mere creation of grammarians: at any rate, the supposed character for the soft breathing is found in no inscription whatever, and in no manuscript of any antiquity.—Of the next letter it need only be stated, that the Hebrew character is generally considered by modern Hebraists as a mere T, and it is often called *teth*.—Of the *iod* the Samaritan form seems even more perfect than the Greek in 9, 10, 11, 14, 15, 16, 17. The third of these, however, bears a close affinity to the Hebrew. The forms in 12 and 16 are gradually approaching the straight line, which afterwards prevailed.—The *kappa* in 21 is a mean between the more perfect in No. 9 and the Hebrew *caph*.—The next letter has a great uniformity throughout, the chief difference turning upon the different position of the angle as in the *gamma*; but it may be observed, that the forms in 27 and 28 closely approximate to the Phenician and Hebrew in 1, 2, 3.—Of μ and ν we have spoken before.—The *samech* and Greek ξ present many difficulties. Their forms, in the first place, have no similarity; the Greek letter is rarely met with in old inscriptions, as it was common to employ in its place the χ and σ, as may be seen in 23 and 29 (or else κσ as in the Nanian column.) The X given in 9, though found in Greek, is more common in Latin; yet even in this language the old inscriptions generally have XS rather than X alone; so that it would seem that here, too, the X had originally the power of the Greek χ. The reason why the Greeks generally wrote ΧΣ rather than ΚΣ or ΓΣ, was most probably because the letter *sigma* has something of the nature of an aspirate, as Payne Knight contends. Upon the same principle they wrote ΦΣ for Ψ or *ps*. (See column 29.)—The letter *ayin* is the subject of controversy, some calling it a nasal consonant, others a guttural, others a vowel *o*. The first and third assertions seem more at variance than they really are, for the close connexion between the two sounds *n* and *o* is well marked in the Portuguese tongue in the pronunciation of such words as João, the representative of our John or Johann. The Romans too thought it enough to write Plato, where the Greeks wrote Platon. Lastly, if the vowel and liquid scales that have been given above be applied to one another, it will be found that the liquid *n* ought to have an affinity to the vowels *o* and *a*,* in the same way that the lip liquid *m* is related to *u* and *w*, and the palatal *l* (witness the *mouillé* sound of the French *ll*) to *y*, *i*, and *e*.—But, to proceed, the Hebrew *pe* has, it has already been observed, a stroke at the bottom which appears to have something of the nature of a flourish. Remove it, and the identity of the remainder with the Greek is self-apparent. The difference between the Greek Π and the Roman P is chiefly due to modern printers. The Greek had almost invariably its second leg much shorter than the first, and the Roman P very rarely had the circular bend completed so as to reach the main shaft. See the plates, and, above all, compare the Etruscan P in 7 with the Roman P in IV. 3.—The letter *tsadi* has no representative in the Greek alphabet, unless, indeed, it bear any relation to the Greek figure called *sanpi*, which, however, was never used, as far as it is known, for an alphabetic character; and secondly, even as a numeral, it does not occupy the place between π and *koppa*.—In the *koppa*, the Hebrew, or perhaps rather the Phenician, has a fuller and a more perfect form than the Greek; but be this as it may, the connexion between them requires no comment.—If the ρ in 9 or 11 be the earliest form, the derivation of the rest is simple. The Hebrew has suffered the same injury as in *beth* and *daleth*, a comparison with which will remove all doubt. In 3, 13, and more fully in 22, 24, 27, we see the origin of the Roman *r*.—The original form of *shin* was perhaps as near the Hebrew as any of our characters; but, in fact, the difference between the *shin* in 1 and 4, and the Greek *sigma* in 9, 14, 15, 16, 17, 26, &c., or the Etruscan in 6, depends solely upon the altered position. The relative situation of the several strokes among each other is the same in both.—The next letter, *sin*, should perhaps have been omitted, as the difference between the power of *sin* and *shin* arises solely from the position of the point which is near the right tooth in *shin*, near the left in *sin*. So completely are the two characters one in their origin, that they stand for the same number in the series of Hebrew letters.—The T in 6 would be a fit and proper parent for all the other forms. In the three characters, 1, 2, 3, 7, 8, the cross stroke has had an unfair preponderance to one side, as is the case again in our modern small character. In the Hebrew a little flourish has added to the difference.—The next letter, it has been already observed, seems to have grown out of the *ayin*. Its forms vary, but not unintelligibly. The modern *u* and *v* are, it has been already said, both derived from the Latin form, which had the double power of our consonant *w*, and our vowel *u*.—With regard to φ and χ, we find in 14 the double forms used before they were adopted.—Of the ψ, mention has been already made.—Ω brings us to the close; and it may be sufficient to observe, that among the forms given to this letter by Mionnet, in his work on antient coins, one consists of an ordinary *o* lying upon a horizontal straight line. This has led to the notion that the letter was thus originally formed to mark a long *ō*, and, in confirmation of this notion, the letter H, as written in No. 9, was appealed to, which it was contended was formed in like manner from the letter E, with a perpendicular stroke on the right. The form of ω, in 32, would appear to be made up of the letter *ayin* or *o* repeated, precisely as our own *w* has its form as well as name from a repetition of *u* or *v*. The letter ω as well as η were not used in public documents at Athens until the year 403 B.C., when Euclid was Archon, but it must not be supposed that the letters were then invented, for, as Payne Knight has observed, the ω appears on the coins of Gelon, who died 478 B.C., and the η on very antient coins of the Regians. Still in early times it was the ordinary practice to use ο and ε for both long and short vowels.

In forming a table of the real Roman characters, there is some difficulty from the circumstance, that nearly all those who report antient inscriptions take the liberty of using modern characters. Of those given in plate 4, the first is from the fac-simile of the Bacchanalian inscription given by Drakenborch in the seventh volume of his *Livy*; the date of which is fixed at 186 B.C., by the names of the consuls given in the decree. This inscription is in the Cæsarean Museum at Vienna. The second and third columns are from an inscription given by Maffei, in his *Istoria Diplomatica*, p. 38, and here the date is fixed to the year 27 A.D., in the reign of Tiberius, by the names of the consuls, M. Crassus Frugi, L. Calpurnius Piso. Column 4 is from the same work of Maffei, p. 31, and belongs to the year 68 or 69, as is determined by the mention of the Emperor Galba. Both these inscriptions are of very coarse execution. Fac-similes of some very antient inscriptions are also to be seen in the works on Herculaneum and in Muratori. The characters of the Medicean MS. of Virgil, preserved at Florence, are taken from Burmann's engraved specimen, in the first volume of his edition of that author, p. xxxvi. of the Preface. The remaining alphabets of that plate are from Astle's *Origin of Writing*. The separate alphabets, beginning with the Coptic and ending with the Runic, are chiefly from the French *Encyclopædia*.

The Roman alphabet requires but little comment. It has been seen how completely it agrees with the Greek. In the order of the letters the only violent difference consists in the insertion of the G after F, but what place could be better suited to it than the position of Z, a character which had no correlative in the Latin series? Our modern grammars, indeed, give both *y* and *z*, but Suetonius tells us indirectly that the Roman alphabet terminated at *x*, for the Emperor Augustus, he observes, employed a peculiar cypher in his papers. For the letter *a* he wrote *b*; for *b*, *c*; and so on, until for *x* he wrote *a* or *aa*. Some commentators, indeed, scandalized at the ignorance of Suetonius in not knowing his own A, B, C, have substituted *z* for *x* in the above passage. But, in fact, there is not a single Latin word that contains either *y* or *z*. Modern printers have further increased the Latin alphabet by giving in two instances double characters where the Romans had but one. The letter I of the Romans, besides its power as a vowel, represented also the closely-allied sound of our consonant Y, or the German J. When it is used with this consonantal power, modern printers have taken the liberty of substituting the character J, and modern readers have aggravated the error by giving it the sound of that English letter. Thus the Latin word IVGVM is now printed and pronounced *jugum*, instead of *iugum* or *yugum*, so as to destroy the close similarity of the word to the corresponding English term, *yoke*. Again, the Roman letter represented by *v* in inscriptions, and by *u* in the round form of manuscripts, has suffered the same fate. As a vowel, it has *u* for its character in modern books of Latin. But the Romans, as we have already stated, also employed it as a consonant, equivalent to our *w*. In this case the printer has preferred the sharp form *v*, which has again misled the modern reader as to the sound. When pronounced correctly, the Latin words *vespa*, *vastare*, *ventus*, bear a close analogy to our own terms *wasp*, to *waste*, *wind*. The letter K, though it became unnecessary when the third character was changed from a *gamma* to C, is a genuine member of the Roman alphabet, though often excluded from school grammars.

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* The connexion between *a* and the final nasals is exhibited in the Ionic plurals of passive verbs, the double form of the accusatives of the third declension, and the Greek numerals δέκα, ἕπτα, &c., compared with the Latin.

It would be rather an amusing subject of inquiry, to trace to their source the remarkable differences in the magnitude of our modern small characters, some rising above, others descending below the general line. The first attempts of certain letters to shoot out into an undue extent may be seen in several parts of Plate IV., and we will leave the development to any reader who may be disposed to pursue it. It is but right to state further that the remarks we have made, and the alphabets we have given, are by no means sufficient to enable any one to read antient MSS. Independently of the varying forms of letters, there are numberless contractions, which can only be learned by long practice.

ALPHEIUS, one of the chief rivers of Peloponnesus (Morea), which rises in Arcadia, and flows through Elis to the sea, receiving in its course the rivers Helisson, Ladon, Erymanthus, Cladeus, &c., and numerous smaller streams. It is now called Rofea, up to its junction with the Ladon; and above that, the river of Karitena. It drains a large mountain district, bounded by Mount Erymanthus on the north, the central ridge of Arcadia on the east, and the mountains of Laconia and Messenia on the south. Its rise and early course are marked by some singular circumstances. According to Pausanias, the fountain is at Phylace (Krya Vrysi), near the foot of Mount Parthenius, at the south-east corner of Arcadia, where the boundaries of Arcadia, Argolis, and Laconia meet. Near a place called Symbola, (the 'meeting of the waters') it is joined by a considerable stream, and sinks underground; it rises again five stadia from Asea, close to the fountain of the Eurotas. The two rivers then mix their waters, and after flowing twenty stadia, are again swallowed up, and re-appear,—the Eurotas in Laconia, the Alpheius at Pegæ (the Springs), in the Megalopolitan territory, and in Arcadia. Strabo, however, says that the Alpheius sinks, instead of rising, at Abia, and adds a fable, that garlands consecrated to either stream, would re-appear in that particular stream, if thrown into the united waters before they sunk underground. The statement of Pausanias is confirmed, and the course of the upper stream (now the Sarandapotamo) traced by Colonel Leake (*Travels in Morea*, vol. i. p. 121) to the spot where it enters the earth, below Phylace. He confirms the statement of its rise (or at least the rise of some subterranean stream) at Francovrysi, near Asea. Here there are two sources or emissaries, one of which he supposes to be the vent of the lake or marsh called Taki, not far from Tegea, north-east of Francovrysi; the other that of the Sarandapotamo. (Vol. iii. p. 42.) One of these probably is the supposed source of the Eurotas, mentioned by Pausanias. These streams, after joining, enter a lake, and again sink into the earth. Passing under a mountain called Tzimbaru, the Alpheius re-appears at Marmora, near Rhapsonati, probably the Pegæ of Pausanias. These subterranean descents are not uncommon in the Arcadian rivers, and are called by the modern Greeks, *Katavothra*: similar instances are collected in the *Encyclopédie Méthodique*; *Géog. Physique*, art. *Absorbans*. Due south of the Katavothra, and about the same distance from it as the emissary at Marmora, is another emissary in Laconia, in the valley north of Mount Khelmos, which may be considered as the principal source of the Eurotas; and Colonel Leake thinks it not impossible that the statement of Pausanias may be correct; and that in their subterranean passage the waters do, in fact, divide into two streams. The height of the waters in the lake and rivers, however, prevented his examining minutely into the phenomena of the place.

Below Pegæ, the river is joined by the Helisson (now the river of Davia), on which Megalopolis was situated, not far from the confluence. Below this, between the modern towns of Karitena and Andritzena, the Alpheius descends through a ravine, formed by the closing in of the mountains on either side, and called the Straights of Lavdha. This pass separates the upper and lower plains of the Alpheius; in the former of which, the chief city was Megalopolis, in the latter Heræa. Entering Elis, it runs through the plains of Pisa, past Olympia, and falls into the Cyparissian Gulf. At the mouth of the river was the temple of Diana Alpheiusa, or Alpheia. 'From the Straights of Lavdha to the sea, there is a narrow level on either bank, inundated in winter, and planted with maize in summer: the river is wide and shallow, and its banks produce a great number of large plane trees.' (Leake, vol. ii. p. 67.)

This river is very celebrated in song. Ovid tells how the river god, being enamoured of the nymph Arethusa, whom he saw bathing in his waters, sought her love. She fled, and he pursued; till being exhausted, she prayed for help to her patron goddess Diana, who transformed her into a fountain. But Alpheius still sought to mingle his stream with hers; and Diana was forced to open an underground passage for her favourite to the island of Ortygia, a part of Syracuse. The persevering river was fabled to pursue the object of his love even to this distant point, passing under the sea, without mingling his waters with it. Hercules is said to have cleared the stables of Augeas, by turning a part of the Alpheius through them. Frequent mention of this river is made by Pindar. (See Pausanias; Strabo; Ovid, *Met.* v. 572; and for modern authorities, Leake's *Travels in the Morea*.)

ALPS, the name of a large mountain system in Southern Europe, which is generally supposed to derive this appellation from a Celtic word *Alb*, or *Alp*, signifying 'white.' [See ALBION.] It is rather singular that the Swiss give the name of Alps to the high pastures which cover the sides of the mountains, as far as the line of permanent snow. (See *Orographie de l'Europe*.)

The Alpine system, in its full geographical extent, may be considered as connected with the chain of mountains that runs through the Italian peninsula; and the point of its junction with the Apennines cannot therefore be accurately determined. Some fix the commencement of the Alps at the depression of the valley of Savona, and others at Capo delle Melle on the gulf of Genoa. Assuming it to commence at this cape, its general course is westerly as far as the Col de Tende, from which point it takes a N.N.W. course as far as the sources of the Stura, one of the affluents of the Po. From this last point it runs north in an irregular direction to about 45° 45′, separating the upper part of the Po valley from that of the Rhone, and part of France and Savoy from Piedmont. Near the lat. of 45° 50′ we find the highest elevation of the Alps, Mont Blanc, and also a change in the general direction of the range from N. to E.N.E., which in fact is continued as far as the Danube.

The valley of the Rhone, and the great hollow of the Lake of Geneva, separate the Alps from the Jura, which chain, however, is closely connected with the great mass of the Alps, though it will be best described under a separate head. The Jura has a general direction N.N.E., and several points of connexion with the central mass; but the most distinct is that line called the Jorat, which, branching out from the Molesson and Jaman, two calcareous mountains of the Alps, runs in a westerly direction, and forming the steep northern boundary of the Lake of Geneva, joins the Jura near the town of Lassara. This line separates the waters which flow to the Lake of Geneva and thence into the Rhone, from those which join the Aar and descend into the Rhine.

From the great bend of the Alps near Mont Blanc, the central mass runs towards the sources of the Drave and Salzach through the Grisons and the Tyrol as far as the Grand Glockner, where it is divided into two main branches. But between Mont Blanc and the Grand Glockner, and about the meridian of 9° 45′, we find a chain detaching itself northward from about Mount Septimer, and running past the sources of the Inn to those of the Lech. This elevation separates the affluents of the Lake of Constance and the Rhine from those of the Danube. But before reaching the sources of the Lech, this offset sends out another, which runs along the left bank of the Inn. This second range contains the Solstein mountain, which has an elevation of about 9700 feet, and contains the well-known salt-beds of Hall. Of the two great divisions at the Grand Glockner, the northern branch continues its direct course to Vienna on the Danube. The southern branch may be considered as subdivided into two; one of which runs towards the confluence of the Drave and the Danube; the other takes first a southerly direction till it approaches the Gulf of Venice near Fiumi, when it assumes a S.E. course, and under the name of the Dinaric Alps may be considered as a prolongation of the great mountain system of Europe. Indeed the great mountain-chain of the Grecian peninsula, as well as the Balkan which terminates at the Black Sea, may be geographically considered as a prolongation of the Alpine system. The mountains generally considered as comprehended within the denomination of the Alps, lie between 44° and 48° N. lat., and 6° 40′ and 18° E. long. But our description of them is here chiefly confined to the main mass, as far as the division at the Grand Glockner. The other portions will be noticed more particularly in the several countries to which they belong.

By geographers the Alps, in a limited sense, have been divided into—1st, the Maritime, or those extending from the Mediterranean to the Monte Viso, a distance roughly estimated at about 100 miles; 2nd, the Cottian, from the Monte Viso to Mont Cenis, about 60 miles; 3rd, the Graian, from the Mont Cenis to the Col de la Seigne, about 60 miles; 4th, the Pennine, the chain which bounds the southern side of the Valais, from Mont Blanc to the Simplon, about 60 miles; 5th, the Helvetian or Lepontian, the southern boundary of the Upper Vallais, extending to the St. Gothard, about 60 miles; 6th, the Rhætian, which extend from the sources of the Rhine to the Dreyherrn-Spitz, east of the valley of the Adige, about 80 miles; 7th, the Noric, 8, the Carnic, and 9, Julian Alps. The two last branch off east and south from near the Grand Glockner. The Noric is a chain extending to the Danube near Vienna; the Carnic to the confluence of the Drave and the Danube; and the Julian Alps, which enclose the Save, to Belgrade on the frontiers of Turkey. Besides the mountain masses which stand up against the central chain like buttresses and slope down far into the plains on each side, there are some great ranges of mountains which join the main chain of the Alps at acute angles; such are the Bernese Alps, descending from the Gallenstock at the Mont St. Gothard, and extending to the north of the Lake of Geneva; the chain east of the St. Gothard, which divides the Vorder-Rhin from the Hinter-Rhin; and a line of mountains, already mentioned, on the north of the valley of the Inn, extending along the course of that river. The true chain and dividing line of the waters is the southern boundary of the Inn, which it divides from the Valtelline, the Vinchgau, and the Pusterthal. A more southern chain, commencing at Monte Legnone, near the Lake of Como, forms the southern boundary of the Valtelline and the Vinchgan, and after the interruption of the Adige, it bounds also the southern side of the Pusterthal, and again divides where the Save takes its rise. Of the branches beyond the Grand Glockner that may be considered the true chain, which, for some way forms the northern boundary of the valley of the Drave, and then extends towards the Danube. The whole constitutes an unbroken range which cannot be avoided by any détour in passing out of Italy to France, Savoy, Switzerland, the Tyrol, or Germany.

The geographical position of the main mass of the Alps is remarkable as lying about midway between the equator and the North Pole: the following positions and elevations, between Monte Viso and the Grand Giockner, are included within the line which we have described as that properly denominated the main mass of the Alps.

Names.	Lat.	Long.	Height in Eng. feet.
Monte Viso	44° 40′	7° 5′	12,582
Mont Genèvre			11,781
Mont Cenis			11,457
Mont Iséran	45° 30′	7° 16′	13,267
Mont Blanc	45° 50′	6° 51′	15,732
Mont Cervin		7° 43′	14,835
Monte Rosa	45° 56′	7° 52′	15,150
Mont Gothard			12,000
Gallenstock	46° 37′	8° 24′	12,477
Vogel Berg, or Piz Valrhein	46° 29′		10,866
Ortler Spitz	46° 28′	10° 32′	12,852
Gebatsch			12,276
Grand Glockner	47° 7′	12° 43′	12,776

In the great chain which branches off from the Alpine mass, runs along the northern side of the Vallais, and joins the Jorat to the north of the Lake of Geneva, we have the following elevated peaks:—

Names.	Lat.	Long.	Height in Eng. feet.
Finster-Aar-Horn			14,109
Jungfrau (Virgin)	46° 32′	7° 57′	13,716

The great valleys of the Alps lie nearly in the direction of the main chain; such are the Vallais in which the Rhone flows, the valley of the Inn, which is about 150 miles in length, and the still longer valley of the Drave, which is above 200 miles long. The transverse valleys are comparatively short: on the south side where they communicate with the valley of the Po, they are nearly at right angles to the main chain, and terminate in lakes, such as those of Maggiore, Como, &c. The valley of the Adige, the head of which is at the Brenner mountain, has a course within the mountains about S.S.W. and is the longest transverse valley of the Alpine chain. It is observed that in the line of the Alps which runs in the general direction of west and east, and also in those offsets which make a small angle with the main chain, the southern slope is much steeper than the northern. Consequently the valleys on the Italian side are much lower than those on the north side: the surface of the Lake Maggiore is 678 feet above the level of the sea; that of the lake of the four cantons, sometimes called the Lake of Luzern, has an elevation of 1400 feet. The Lake of Brienz is about 1900 feet above the level of the sea, and that of Thun only a little lower. It follows naturally also from the rapid slope on the south and the proximity of the Mediterranean, that the secondary branches of the Alps are principally on the north side of the main mass.

It is very difficult to obtain any precise measure of the breadth of the Alps. If we take the direct distance from Bellinzona, on the Italian side to Altorf, on the Swiss side, which certainly does not comprehend the whole breadth of the Alpine mass, we find this to be about fifty miles of direct distance. The direct distance from Aosta to Fribourg, across the Valley of the Rhone, is above seventy miles; but this measurement comprehends the breadth of the main chain, and the offset which runs from St. Gothard to the Jura, with the intervening valley. East of the Grisons the range increases considerably in breadth; from the Wurm See to a point a little north of Verona, is a direct distance of 150 miles. From the point where the Alps divide near the sources of the Drave and the Salzach, the breadth occupied by each branch requires a separate consideration.

The most remarkable features of the Alps, in a commercial and political point of view, are the passes, which we shall notice in order according to the divisions already made.

The Maritime Alps.—In apparent contradiction to a preceding remark, Italy may be entered from France, and the Alps may be avoided, except as to the capes which terminate the chain, by going along the coast of Liguria, and entering Nice from Provence. The most southern pass across the Alps is that by the Col de Tende; it was made practicable for mules by the Dukes of Savoy, and for carriages by Napoleon. Two great buttresses of the Alps are crossed before reaching the Col de Tende; they are the Col de Brous and the Col de Brovis. The pass of the Col de Tende is very dreary, though the elevation is not considerable, being only 5887 feet above the level of the sea. The route, after descending from the Alps, passes through

Coni and Savigliano to Turin; this is the only great carriage-road over the Maritime Alps. There are many lines of communication with France practicable for mules: by the valley of the Stura, in Piedmont, and the Col d'Argentière, to the valley of the Ubaye, in France; and by the Val Vraita, in Piedmont, over the Col d'Agnello, to the valley of the Guil in Dauphiny.

Monte Viso, which terminates this division, is one of the most splendid mountains in the chain; its peak rises 12,582 feet above the sea's level. Wherever the line of the Alps can be seen in the basin of the Po, this fine mountain is distinguished. The rivers which have their rise in the Maritime Alps are numerous: on the Piedmontese side they are all tributary to the Po. The Gesso, the Stura, the Maira, and the Vraita, are tributaries of the Po, which rises at the foot of the Viso, and in its course collects all the streams of Piedmont: those which flow into Liguria and France are the Roya, the Var; and the Ubaye, which falls into the Durance.

The Cottian Alps.—The only carriage-road across this division of the Alps is that of the Mont Genèvre, which was executed by order of Napoleon; this pass was known to the Romans. It leads from the valley of the Durance in France, to Susa and the valley of the Dora in Piedmont. At Susa the road to the Mont Genèvre passed under a triumphal arch, which still exists. Another route across the Cottian Alps is by the valley of the Bardonneche, whence a stream flows into the Dora Susanna: this valley leads by the difficult pass of the Col de la Rue to Modane in the Maurienne. It is supposed to have been the pass taken by Julius Cæsar, when he crossed the Alps to attack the Helvetii. The chief rivers which take their rise in the Cottian Alps are the Dora Susanna, on the side of Piedmont, and the Durance and the Guil on the side of France.

The Graian Alps.—Mont Cenis is usually included in this division. It is perhaps the most frequented of all the passes across the great chain. There is no evidence of its having been known to the Romans; it has been frequently confounded by historians with the pass of the Mont Genèvre, as the two roads unite in the descent from their passes into Italy at Susa. The earliest mention of it is by the historians of Charlemagne, who record, that Pepin passed this mountain with an army to attack Astolphus, king of the Lombards. It continued a difficult mule-road until, by order of Napoleon, the present magnificent route was begun in 1803 and completed in 1810. This road leads from Lans-le-bourg in the valley of the Arc, in Savoy, to Turin. The elevation of the pass of Mont Cenis is 6773 feet above the level of the sea. From the upper part of the Valley of the Arc above Lans-le-bourg two or three passes are found leading into the valleys of the Viu and the Lanzo in Piedmont; and from the upper valley of the Isère mountain-passes lead into the Val d'Aosta. The principal of these is the pass of the Little St. Bernard, which was known to the Romans, and appears to have been made practicable for cars by order of Augustus; but though described by Saussure as the easiest of all the passes of the Alps, it is only practicable for mules. Napoleon had ordered a survey of the road preparatory to facilitating the intercourse of people divided by the Alps; this was however delayed. The evidence brought together by various authors to show that by this pass the Carthaginians under Hannibal entered Italy, is considered by some as conclusive; so many essential points confirm the account of Polybius, the nearest historian to the time of the event. But this opinion is not without some difficulties. The Col is nearly a league in length, over a fine pasturage, though at an elevation of 7190 feet above the sea. On it there is a column of great antiquity, supposed by Cambry to be Celtic; certainly it forms no part of a Roman temple, which formerly existed on the mountain, and of which a plan can be traced. There is also a large circle of stones on the plain, called by the people of the country the Cirque d'Hannibal. The route to and from the pass of the Little St. Bernard is by the valley of the Isère in the Tarentaise, and the Val d'Aosta in Piedmont. The Col du Bon-homme is usually the point of division between the Graian and the Pennine Alps; but this col is not across the great chain. It leads, however, by the Savoy side to the Col de la Seigne, where commence the Pennine or High Alps. The chief rivers which rise in the Graian Alps are the Northern Stura and the Orca, both flowing across Piedmont into the Po; towards Savoy flow the Arc and the Isère, which rise in different parts of the lofty Mount Iséran, but unite above Montmelian; and the united stream joins the Rhone above Valence.

The Pennine Alps.—This is the loftiest portion of the range, including Mont Blanc, Monte Rosa, and Mont Cervin, the three loftiest peaks in Europe. On each side of Mont Blanc are cols or passes of the mountains, usually traversed by pedestrians in their tours about Mont Blanc; these are the Col de la Seigne, and the Col de Ferret. From Mont Blanc the chain takes an E. N. E. course, and the first great passage across the Pennine Alps lies between Aosta in Piedmont, and Martigny in the Vallais in Switzerland. This pass, which is by the Great St. Bernard, is of high antiquity, but it has never been practicable for cars: the passage of Napoleon across this col in 1800 has given it historical celebrity. The Hospice, situated on the summit, at an elevation of 7963 feet above the level of the sea, is the most noted of these benevolent establishments throughout the whole mountain chain. Between the Great St. Bernard and the Simplon, there are two other passes: the first is the Cervin, which is the loftiest pass in Europe, being 11,096 feet above the sea's level. It is the path traversed in going from Châtillon in the Val d'Aosta to Visp, in the Valais; the second is the Moro, the pass east of the former, which leads from Visp to the Val d'Ossola: this appears to have been an ancient mule-road, but the advance of the glaciers has destroyed it, and the route of the Simplon superseded its use. The pass of the Simplon is the most eastward of those in the Pennine division. This magnificent work, another of the great benefits accomplished by Napoleon, leads from the Vallais to Milan: its construction was completed amidst difficulties far surpassing those of any other route that has been made across the Alps, though its elevation is only 6578 feet. The principal rivers of this division are the Dora Baltea, the Sesia and the Dovedro, on the side of Piedmont; and the Arve, and numerous other tributaries to the Rhone, on the side of Savoy and Switzerland.

The Helvetic or Lepontian Alps.—East of the Simplon is the pass of the Gries, which can be traversed by laden mules, though it lies across the glaciers; it leads from the upper Vallais to the Val d'Ossola, in Piedmont. But the chief pass of the Lepontian Alps is that of the St. Gothard, which leads from Bellinzona, on the southern side of the chain, through the Val Levantine, to Altorf, and the lake of the Four Cantons in Switzerland. This had long been a line of great commercial intercourse, though only a mule-road; a good carriage-road, however, has just been completed across it, and the benefits of a greater facility of intercourse will soon be felt by all the forest cantons, and others in communication with them. The height of the pass is 6890 feet. This is the only pass in the chain where a road may be made across it at right angles, passing but a single ridge: in any other pass if a direct course were taken it would lead across one or two other ranges. In this division some of the largest Alpine rivers have their sources; the Rhine and the Reuss on the north; the Toccia, the Tessin, and the Maggia, which join the Po; and the Rhone, which enters the Mediterranean.

The Rhætian Alps.—Across this division of the chain there are now five good carriage-roads; first, by the Mont St. Bernardin, at an elevation of 6700 feet, leading from the Lago Maggiore, Bellinzona, and the Val Misocco, to the Rheinwald, and to Coire. This road has just been made by the people of the Grisons. The second is a line from the Lake of Como and Chiavenna, over the Splugen to the Rheinwald, a pass which was known to the Romans: it falls into the route from the St. Bernardin to Coire, at the village of Splugen, whence the road runs through the Via Mala, and the finest Alpine scenery of the Grisons. The new route of the Splugen is lower than that of the St. Bernardin; it was recently constructed by the Austrian government. The third carriage-road leads from Chiavenna up the Val Bregalia, and passes the great chain over the Maloya into the upper valley of the Inn, whence it follows the course of the Inn to Innspruck.; this route has been made by the Grisons to communicate with a new road over the Julier, 8130 feet high, a pass which, crossing the northern boundary of the Inn, leads to Coire, the capital of the Grisons. The fourth great road leads from the valley of the Inn across the chain to the source of the Adige; a little above Nauder it attains its greatest height, which is not 4400 feet; it is the lowest of all the passes across the great range.

Descending a little way into the valley of the Adige, it traverses a buttress ridge over the Monte Stelvio, the new Austrian road, which leads to Milan by the Valteline; the elevation of the summit of this pass, though on a secondary range, is 9174 feet; it has been lately constructed by the Austrian government, to obtain an unbroken line of communication, through its own states, with Lombardy; it is the loftiest carriage-road in Europe. The fifth is the great road from Verona, by the Brenner pass, to Innspruck; it ascends by the valley of the Adige to Botzen, thence by that of the Eisach to the Brenner, elevated 4660 feet above the level of the sea; from the Brenner, the road descends by the course of the Sill to Inspruck.

In the length of the Rhætian chain, many minor passes are found, and especially across the northern branch, communicating with Coire; among these are the Septimer, the Julier, and the Albula; and across the southern branch a new road has lately been made by the Austrian government from Piave da Cadore to the Pusterthal.

The chief rivers which rise in the Rhætian Alps, are the Muesa, the Maira, the Adda, the Oglio, the Eisach, and the Adige; these all rise on the south of the great chain, and flow into Lombardy. On the north is the Hinter-Rhein, which joins the Vorder-Rhein at Reichenau, and afterwards collects all the streams on the northern side of the Bernese chain; the Aar, the Linth, and the Reuss, bearing these and a thousand minor tributary streams to the Rhine. East of these, but flowing from the northern side, are the Inn, the Oes, the Sill, and the Ziller, which, united under the name of the first, flow on to the Danube. From the southern chain of the Tyrol spring the Brenta, the Cordevole, the Piave, and the Tagliamento; which, after watering the plains of Friuli, flow into the Adriatic.

The Noric Alps.—These mountains form at their western extremity a lofty range, especially the Grand Glockner, at the head of the Möllthal, which divides the latter valley from that of the Salza. The high road from Venice to Salzburg crosses the great chain at the Radstadter Tauern at the height of 5413 feet, after having passed over the Carnic branch at Tarvis. Farther east, the road from Trieste to Vienna crosses the Julian and Carnic chains, besides a branch connecting itself with the Noric; but so numerous are the ramifications of the Alps here, that the valleys of the Save, the Drave, and the Muhr, and their tributary streams, scarcely define the separations. Many carriage-roads, well constructed and well preserved, traverse these Alps; and the scenery of these lower and eastern ranges, known only to few English travellers, is nowhere surpassed in the whole extent of the mountainous districts from the Rhone to the Danube.

Before the period of Napoleon's power, it was the narrow policy of the European states to leave every barrier as nature made it, and thus to restrain free intercourse between the nations which it divided; this tended to the encouragement of political prejudices, and the withholding of political and commercial benefits between one nation and another. The advantages, however, were soon perceived which sprung from the formation of the routes of the Tende, the Genèvre, the Cenis, and the Simplon; and, following the splendid example which Napoleon set them, the states which have the Alps for their frontier have subsequently formed, and are still forming, admirable carriage-roads across passes formerly considered impracticable.

In the parallels of the Alps, owing to the great elevation of these mountains, we find the summits of many of them perpetually covered with snow. The point where the snow-line commences must necessarily vary in summer and winter, but even during the hottest summer snow is always found at an elevation varying, according to local circumstances, from 9000 to about 9500 feet. These large masses of snow and ice are generally called Glaciers; a term, however, that is perhaps more properly applied to the masses of snow that fall down into the valleys, and there form large masses of ice, sometimes presenting a tolerably level surface, and sometimes, when the slope of the valley is rapid, exhibiting huge fissures and fantastic varieties of form. These masses of snow and ice are the sources of some of the largest rivers of Europe. They often descend in the narrow transverse valleys considerably below the line of permanent snow. More than four hundred glaciers are reckoned: different portions of the great masses bear separate names, and vary from six or seven leagues to one league in length. There are numerous glaciers of the larger size; in width, they vary from a quarter of a league to a league, and many of them are estimated to be from 100 to 600 feet thick: by a fair calculation their aggregate surface appears to have been taken at 130 square leagues. One of the most terrible calamities to which the inhabitants of the Alpine valleys are exposed, is the sudden descent of masses of snow which sometimes cause dreadful devastation. These are generally termed Avalanches, or sometimes lauwines.

A remarkable feature in the Alps is the occurrence of lakes on or near the crests of the passes. A pass is never over a summit of a mountain, but over the lowest traversable point. In determining the direction of the path or road, a valley is ascended to the source of the stream which flows through it; this will generally be found on or near the ridge or col, between two mountains, whence another stream follows the slope or valley on the other side. To this general rule there are few exceptions: there is scarcely a pass which is not commanded by mountains; and where the ridge or col is wide enough to receive the water which streams from them, and retain it, lakes are formed, the sources of the rivers which flow from the passes: such is the Mont Genèvre, where the Durance towards France, and the Dora Susanna towards Piedmont, flow from almost a common source. The lakes on the Cenis, on the Great St. Bernard, the St. Gothard, the Bernardin, are of the same kind.

Many of the loftiest summits and peaks of the Alps have been attained by adventurous naturalists and travellers, but these difficult and perilous expeditions have, in general, been undertaken rather for the gratification of the traveller than for the promotion of science. Saussure made various valuable experiments at the greatest elevations, and little or nothing has since been added to the results which he obtained. Many travellers have now ascended Mont Blanc; and Monte Rosa has been ascended several times by M. Delapierre, Inspector of the Forests of the Val Sesia: the Ortler-Spitz has been surmounted by Dr. Gebdhard of Innspruck; and even the Jungfrau or Virgin Mountain, which rises to the height of 13,716 feet, and owes its name to its supposed inaccessibility, has had her highest peak surmounted by the alpenstock of a Swiss peasant.

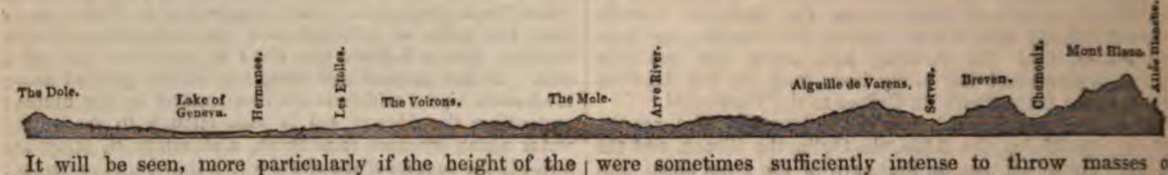
Excursions in the Alps within the last fifty years, and especially since the peace of 1815, have been sources of pleasure and of health to numerous visitors, especially from England. Every summer hundreds are to be found wandering there; and so certain is their return with the season, that guides bred to this employment are always found ready to accompany them into all the sublimest and most beautiful regions of the Alps. There is a spirit in the mountain air, and a degree of buoyant health derived from seeking it, which never fail to gratify the traveller. Many precautions are necessary in regions absolutely dangerous, and in which it is more bold than wise to ramble alone. The advice of the guides should be implicitly followed, as they are the best judges as to the danger or practicability of accomplishing any undertaking.

The number of mines that are worked in the Alps is not very considerable when compared with the great extent of the mountains. Some gold and silver mines are worked, as at the Rathausberg, &c.; and others of copper, lead, iron, alum, and the species of coal called anthracite. The iron-mines of Styria, Carinthia, and Carniola, are very productive: the Bleiberg (lead-mountain of Carinthia) furnishes some of the best lead in Europe. There are also lead-mines in Savoy, at Pesey, and Macot. The quicksilver-mines of Idria, which are about 27 miles N.N.E. of Trieste, are well known from the descriptions of travellers. (See Russell's *Germany*, vol. ii. p. 362, &c.) Salt is procured at Bex in the canton of Vaud, at Hall in the Tyrol, a little below Innspruck; and in the beds of Hallein, Reichenhall, and Berchtesgaden, all in the neighbourhood of the town of Salzburg. (See *Orographie de l'Europe*, p. 166.)

ALPS, *Geology of.* When we contemplate the Alps in the mass, we are struck with the fact, that while these mountains are furrowed by deep valleys, extending in the direction of the main range, they are also broken by other important valleys meeting the central parts of the chain, at an angle which more or less approaches a right angle. This configuration naturally suggests the idea of cracks and fissures produced by forces acting from beneath, and in a line of considerable length. The longitudinal and transverse valleys precisely accord with this view, which, so far from being destroyed by a strict and detailed geological examination, acquires additional strength by such examination.

It was at one time considered that the Alps were produced by a single great effort of nature; this opinion has, however, given way before facts, and it is now very commonly received that they have been elevated at different periods, probably at great and unequal intervals of time, during which most important changes were taking place on the surface of the earth generally.

From the mode in which we usually regard mountain-chains, we commonly receive very erroneous impressions respecting the true relative elevation of such chains above their bases, so that few, unaccustomed to the investigation of geological phenomena on the large scale, are prepared to consider mountain-masses, such as those of the Alps, and which from habit they call enormous, as the result of simple cracks and fissures, squeezed up against each other. The following diagram, which represents a proportional section of a part of the Alps from Mont Blanc, crossing the lake of Geneva to the Jura, may probably assist the reader in estimating the true value of these mountains when compared with the extent of land which they transversely cover, the heights and horizontal distance being on the same scale, viz., $\frac{1}{600000}$ of actual nature.



It will be seen, more particularly if the height of the loftiest Alps be compared with the radius of the earth, that mountain-masses are by no means so enormous as our imagination inclines us to suppose, but that, on the contrary, they really rise but a small relative height, so that at first sight there is much difficulty in considering a real proportional section of a mountain-range to be correct. Such sections are, however, useful in showing that the relative forces required to fracture rocks and elevate them into mountains are by no means necessarily so great as might, at first sight, be supposed.

Proceeding to examine the nature of the geological evidence, from which we infer that the Alps were not produced by one great upburst of rocks, we find that certain beds have evidently been broken and tilted up at various angles before others were deposited, for the latter rest quietly on the fractured edges of the former. In such cases we have merely to inquire what are the equivalents both of the upset rock, and of that quietly resting on it in the series of rocks generally, and we arrive at the relative date of the dislocation or fracture of the first rock, as it must evidently have taken place before the second was deposited. If we now find, still pursuing our investigations in the same manner, that the second rock has itself been broken and tilted up in another part of the Alps, perhaps farther removed from the central chain, and that a third known rock rests upon its disrupted edges, we obtain another relative date, and a proof that the Alps have been produced by more than one elevation. It will be evident that, by continuing these researches, and by thoroughly examining all parts of the Alps, we obtain the number of elevations by which their present general form has been produced.

Although much has been accomplished, it cannot be said that we possess a body of evidence sufficiently clear to enable us accurately to point out all the principal dislocations and elevations to which the present general form of the Alps is due. M. Elie de Beaumont has inferred that the range extending from the Vallais into Austria has been in a great measure elevated after the western Alps had assumed their present general direction; and he observes that, where the two great ranges or lines of fracture cross each other, as they do around the Mont Blanc, the Monte Rosa, and the Finster-Aarhorn, the dislocations are of a very complicated nature. Without entering into the theory of this author, that lines of contemporaneous fracture are parallel to each other, it may be remarked, that the Alps exhibit several great leading lines of dislocation, impressing marked characters on large portions of the chain, and that many of these fractures have evidently been produced at different times.

The contortions and dislocations of strata in these mountains are for the most part on the great scale: in some cases whole mountains are formed of beds fairly thrown over, so that rocks which have undoubtedly been deposited the latest are seen to plunge beneath, and thus support others of more ancient date, and which, in fact, constituted the solid matter on which they were formed. This fact is not only observed for short distances but over considerable spaces, and, before it was well understood, led to frequent errors. Upon the whole, then, we find that the Alps have been formed by the disruption and elevation of strata at different periods; that the elevating forces acted from beneath; and that they were sometimes sufficiently intense to throw masses of matter, now constituting high mountains, so completely over, that the newer rocks are covered by older deposits at angles even amounting to forty-five degrees.

The older rocks of the Alps are more or less crystalline, and belong to the class of non-fossiliferous rocks, a class often termed primary, from the opinion that they were first formed. The central ranges of the Alps are, in a great measure, though not altogether, composed of these rocks, and consist of gneiss, mica slate, talcose slate, and others of the like character. Gneiss may be considered as very abundant, more particularly that variety which has been named Protogine, and is a compound of felspar, quartz, and talc, talcose chlorite, or steatite. This rock constitutes the mass of Mont Blanc and of several other lofty mountains; sometimes it is schistose, while at others, the beds, if such they can strictly be called, are of enormous thickness without a schistose structure. The thick-bedded gneiss of the Alps often contains large imbedded crystals of felspar or albite, and detached portions of it, even huge blocks, have much the same appearance as the granite of Dartmoor and Cornwall. This kind of gneiss forms, however, long continuous beds, which are sometimes contorted and bent, showing that they have undergone disturbance in the same manner as other stratified rocks. Mica slate is also abundant, frequently passing by insensible gradations into talcose slate, and thus offering instructive examples of the mode in which mica and talc are substituted for each other. The mica slates of the Alps, as is the case with mica slates generally, occasionally contain many minerals, among which may be enumerated garnet, staurotide, cyanite, hornblende, tourmaline, and titanite, the first being often so abundant as really to constitute a very important ingredient of the rock. The mica slate and gneiss alternate with each other, but when viewed on a large scale, the gneiss appears to predominate in the lowest parts. Crystalline limestone is occasionally associated with these rocks, but is by no means abundant. The grain is sometimes large, as, for example, that included among the mica slate of the lake of Como, which has been so extensively employed in building the celebrated Duomo at Milan.

Although the great mass of Alpine dolomite is of less antiquity than the class of rocks now under consideration, there are, nevertheless, some portions of it which may be considered as associated with the gneiss and mica slate in the manner of the saccharine limestones. The dolomite of Campo Longo, (St. Gothard,) several hundred feet thick, is described as distinctly included between gneiss and mica slate. The dolomite of St. Gothard is celebrated for containing numerous minerals, among which may be enumerated sulphate of barytes, corundum, tourmaline, tremolite, talc, mica, and titanite. Our limits prevent a proper notice of the various combinations of these inferior stratified rocks, and of their changes and passages into each other, which are often remarkable; but it may be observed that their thickness must be very considerable, for though subject to bends and fractures, they by no means exhibit those very remarkable flexures and contortions, so common in many parts of the great calcareous series of rocks which rests upon them.

In the Eastern Alps, a group of rocks reposes upon those above noticed, which has not yet been detected in the Western Alps. The beds composing it have been referred to the grauwacke series, the lowest portion of the fossiliferous rocks, or those which contain the remains of animals and vegetables. Though the remains of shells, corals, and encrinites are of the character of those detected in this old fossiliferous rock, it would be desirable to obtain a greater number and variety of such organic exuviæ, as the same general zoological character extends upwards in the series of fossiliferous rocks to the zechstein inclusive. [See GEOLOGY.] It becomes therefore somewhat hazardous to fix with certainty upon any given portion of such series, without a larger catalogue of organic remains than has yet been afforded us. The group now under notice is described as graduating into the crystalline rocks beneath it.

Next in the order of superposition we find sandstones, slates, and conglomerates, often of a red or variegated colour. These rocks have a considerable range through the Alps; and, though by no means constantly present, occur, when they can be observed, above one or other of those previously mentioned, and beneath the great mass of calcareous rocks to be next noticed. The red colour of these beds is more prevalent in the Eastern than in the Western Alps, though it is also observable in the latter. The celebrated Vallorsine conglomerate, long considered as an example of a mechanically-formed rock among very ancient strata, constitutes a portion of these beds in their continuation through the Savoy Alps. This conglomerate, though tolerably abundant in the Vallée de Vallorsine, disappears somewhat suddenly at the Col de Salenton, where the schist, which contains the rounded pebbles at the former place, occurs without them, the beds consisting simply of sandstones and slates. This series of beds may be referred to the epoch of the red sandstone. [See GEOLOGY.] The beds of which it is composed have evidently resulted from the wearing down and partial destruction of the more ancient strata; as is well shown in the conglomerates which contain the rounded fragments of pre-existing rocks, such as gneiss, mica slate, talc slate, &c. Whether this has been accomplished suddenly, by a violent disruption of the older beds, or tranquilly, by a long-continued action of more moderate forces, cannot be considered as well shown; but, at all events, these beds mark a break in the Alpine deposits, for they do not pass into the inferior rocks.

This partial destruction of the older Alpine rocks, however produced, was destined, at least in a great measure, to cease; and an enormous mass of calcareous matter was deposited, necessarily resting upon the various rocks that constituted the floor, or ground, on which the calcareous matter was thrown down; so that it sometimes directly reposes on one and sometimes on another of the various older strata above noticed. This mass, frequently termed the calcareous Alps, because limestone greatly prevails in the mountains which compose it, is intermixed with argillaceous schists and sandstones, both of which vary considerably in their relative proportions to the limestone in different parts of the chain.

In certain schists, sandstones, and limestones, which constitute the inferior beds of the calcareous mass, there is a somewhat unusual mixture of organic remains, particularly in the Western Alps. At the Col du Chardonnet (Hautes Alpes), Petit Cœur near Moutiers in the Tarentaise, Puy Ricard near Briançon, the Buet, the Col de Balme, and other places, a variety of vegetable remains, many of which are also detected in the coal measures of Europe and North America, are associated with belemnites, inasmuch as the latter are discovered in beds both above and beneath those containing the vegetables. Now, according to our present knowledge of other parts of Europe, the organic remains named belemnites, are found only in two great groups of rocks,—viz., the cretaceous and the oolitic. It has been considered that, in the cases here enumerated, the series of beds, containing this curious mixture of exuviæ, should be referred to the oolitic group, as its prolongation, more particularly in the direction of Digne and Sisteron (Basses Alpes), is stated to contain the abundant remains of shells which are commonly detected in the lowest part of the oolitic group, named the lias. Considerable masses of granular limestone and micaceous quartz rock sometimes occur in the lower part of this system.

Many attempts have been made to establish divisions in the calcareous deposits of the Alps, which should correspond with the subdivisions formed in the oolitic and cretaceous groups of Western Europe; but such attempts cannot be considered as having been successful. There can be little doubt that the great oolitic and cretaceous groups constitute a large portion of the mass; but the exact line of separation between these groups, as they exist in the Alps, is far from clear, though, as great accumulations of strata, they may be readily distinguished. When the mineralogical structure of rocks was considered by some a safe guide in geological investigations, the whole of the mass here noticed was referred to what was termed the transition series, as this series was supposed to form a transition or passage between the so-called primary and secondary rocks.

It becomes a point of no small interest to ascertain the reason why the same series of rocks which, even so near as the Jura, is principally light-coloured and often loosely aggregated, should in the Alps be dark coloured and very compact. On the Montagne des Fis, and other parts of a system of mountains which ranges up to the Buet (Savoy), hard, dark, and calcareous rocks represent certain beds of England and northern France associated with the chalk, and probably are also equivalent to a part of the white chalk itself. This is proved both by the geological position of the beds in question, and by the identity, or rather very close resemblance, of the organic remains detected in each. This difference in the mineralogical structure of contemporaneous rocks may be due either to a change in the nature of the original deposit, to the mode in which it was effected, or to alterations produced after deposition. Probably much may be ascribed to the two first; indeed such is evidently the case: but admitting this, we can scarcely consider that these rocks should not have suffered some change from the action of the great disturbing forces to which they have been subjected, and which have often contorted them in such a remarkable manner.

In many parts of this calcareous system, dolomite (a compound of carbonate of lime and carbonate of magnesia, more or less crystalline) constitutes masses of considerable extent and thickness; the stratification often becoming indistinct, and even lost, when the rock becomes highly crystalline. In many cases, this rock seems the result of original deposition, while in others it has the appearance of an altered substance. These dolomites are by no means constant to a particular part of the great calcareous series; sometimes they are associated with the upper, sometimes with the lower part, and consequently occupy parallels equivalent to the oolitic and cretaceous groups, if not to the group beneath these. Gypsum frequently accompanies them; indeed, the association of gypsum and dolomite is common. In the Tyrol and the Maritime Alps the two are so intimately mixed, that crystals of dolomite have been found disseminated through gypsum. The salt of Hallstadt, Hall, Hallein, and Ischel, is subordinate to the lower part of the calcareous Alps, and is consequently on a parallel with some part of the oolitic series of Western Europe.

To present even a sketch of the organic contents of the great Alpine calcareous series would far exceed our limits; but we may remark that a particular genus of fossil shells, named nummulites, once considered as characteristic of those stratified rocks which have been formed since the chalk, descend into the equivalents of the chalk, and probably still deeper in the series. It should also be observed that a fossil sea-weed, named *fucoides*, abounds so much in a particular sandstone, that it has received the name of fucoid sandstone. It is associated with the Alpine cretaceous rocks, and probably, also, with others immediately beneath, and equivalent to the upper portion of the oolitic group. This rock is more particularly observable in the Eastern Alps.

Above the great calcareous mass of the Alps, a series of beds has been discovered, consisting principally of micaceous sandstones and blue marls; the latter alternate with limestones and calcareous grits; and the whole possess much interest from the nature of the inferences which have been deduced from them. The strata in question are well seen in the valley of Gossau, amid the Alps, S.E. from Salzburg, and have hence received the name of Gossau beds. There has been much discussion among geological writers, whether these deposits should be referred to the chalk series, or to the supracretaceous or tertiary rocks above it. The point of difference is, therefore, simply, whether the Gossau beds should be considered as the upper part of one series of deposits, or the lower part of another resting immediately upon it? Less difficulty would probably have attended the consideration of this question, if, during the progress of geological discoveries, it had not happened that a break was observed between the chalk and rocks above it, over a considerable part of the European area, at the time that the chalk was termed the highest part of the so-called secondary rocks. The then newly-discovered rocks were termed tertiary, to distinguish them from those beneath; and it was assumed that the observed break was constant to rocks generally, though upon what solid ground, or even plausible hypothesis, it is difficult to conceive. In the valley of Gossau itself, the beds under consideration are stated to rest unconformably on the older rocks beneath,—that is, the older rocks have suffered disturbance before these beds were deposited.

From the catalogue of the organic remains found in the Gossau, and other equivalent beds in the Alps, by Professor Sedgwick and Mr. Murchison, it appears that out of eighty-nine species enumerated, twenty are considered to resemble certain of the organic remains discovered in the supracretaceous or tertiary rocks, while six are referred to other exuviæ detected in the cretaceous series. Assuming these determinations to be correct, we have evidence that when the Gossau and other Alpine beds of the same date were formed, there was a mixture, in the proportions above noticed, of creatures previously considered to have existed unmixed, the one set living only during the deposit of the chalk series, the other during that of the beds resting upon it. It hence follows that there is at least a zoological passage between the supposed great classes of secondary and tertiary rocks. In the Pyrenees, there are also beds considered to exhibit evidence of the same fact; and at Maestricht, the well-known strata there, so extensively and curiously quarried, are stated to contain organic remains leading to the same conclusions, which are strengthened by facts observable at the contact of the chalk with superior beds in Normandy and elsewhere.

Next, in the order of superposition, we find strata of great collective thickness, known under the names of Nagelfluh and Molasse, the former being conglomerates and the latter sandstones. The various beds are entirely composed of fragments of Alpine rocks, ground down by attrition, and varying in size from a man's head to sand. This variation in size shows that the waters which have transported the fragments into their present relative situations must have possessed different degrees of velocity, and that this velocity must often have been considerable, as the fragments moved are large. Beds of lignites are here and there interstratified with the molasse and nagelfluh, and are worked in various places for economical purposes. In them, or in the strata associated with them, the remains of the mastodon, rhinoceros, palæotherium, and anthracotherium, have been detected. The lignites of the canton of Zürich have furnished a large proportion of these exuviæ. Whether we regard this great accumulation of Alpine detritus as resulting from a series of minor catastrophes, or from the continued action of such causes only as now bear down detritus from the Alps, we still seem to require a great length of time for its production. It is clear, from the organic remains detected in it, that at least a large portion of the mass must have been deposited after great mammiferous animals were called into existence, as it rests upon those beds in which their exuviæ are found. Judging also from the character of the organic remains, some of the strata were formed in fresh waters, while others were accumulated beneath those of a sea.

Such are the stratified rocks which compose the mass of the Alps. It has already been remarked that the crystalline rocks occupy the central part of the chain, though they do not extend continuously through it. In the Eastern Alps, beds that have been referred to the grauwacke series repose on each side, becoming of less importance, and disappearing as they advance westwards. Flanking these last, and the crystalline rocks of the central axis, when the others are not present, are bands of sandstones and conglomerates, for the most part red. These beds are not continuous, at least on the surface, so that the great limestone zones, constituting the two great ranges of the calcareous Alps, one on each side of the central chain, are not always separated by them from the inferior rocks. These two limestone zones are remarkable for the enormous flexures and contortions with which they abound, presenting the appearance of having been doubled back from the central range in consequence of the latter having been upheaved through them. Indeed one sometimes tempted to believe that if they could be pulled like crumpled sheets, and the central axis lowered, the zones would often approach somewhat closely to each other. The Gossau beds are probably far from being known in all their extent. While they are here and there found to intervene between the calcareous Alps and the mass of nagelfluh and molasse constituting the lower and external ranges, as well as the hill country bordering them, they also extend in among the high Alps, as at Gossau itself, filling up pre-existing cavities and valleys. The nagelfluh and molasse, skirting all, are evidently derived from causes acting from the central ranges outwards. The mountains composed of these beds, though low when compared with the central Alps, are still lofty. The well known Righi, which from its base to its summit is formed of them, rises 6182 feet above the sea. This mountain is remarkable for exhibiting the conglomerates and sandstones thrown over in such a way that they appear to dip or plunge beneath the northern zone of limestone, while they are in fact more recent. Although these various stratified rocks may thus be described as forming zones parallel to the central axis, patches of them are often thrust up, or rolled over, out of their general lines of bearing, in consequence of the various disturbances to which these mountains have been subjected.

The granite of the Alps, at least that compounded of the usual minerals not occurring interstratified with the gneiss and mica slate, but, on the contrary, often cutting through them, is by no means that very common rock once supposed. At Baveno, and other places near the Lakes Maggiore, Lugano, and Orta, there are considerable masses of granite, and the quartziferous porphyries of the same district are probably of the same date. Granite veins traversing gneiss and mica slate can be well seen, among other places, in the Vallée de Vallorsine, in the district of Mont Blanc. The granite of these veins sometimes passes into porphyry, and where it cuts through the gneiss, it renders the latter more granitoidal. There can be little doubt that the mass of granite, thus partly visible, has much influenced the direction of the stratified rocks in the same district. M. Necker has observed the important fact, that in the Vallorsine conglomerate, above noticed, he has not been able to find any fragments of this granite, though it abounds with those of the other rocks now in contact with it; whence it has been suspected that the granite was thrown up after the formation of the conglomerate, and consequently, if we admit the date of the conglomerate to have been correctly determined, the granite is not older than the red sandstone series.

According to M. Elie de Beaumont, granite rests upon limestones, equivalent to a part of the oolitic series, at the Montagnes de l'Oisans, Western Alps. The granite is described as cutting through the calcareous beds, rising like a wall, and lapping over them. At Predazzo, granitic rocks rest on beds of the Alpine limestones, and dolomite plunges beneath the granite at an angle of 50° or 60°. In the Swiss Alps, gneiss reposes on beds of the great northern calcareous zone, at the Bötzberg, &c.; and the celebrated Jungfrau is formed of an intermixture of gneiss and Alpine limestone, though, as masses, the former constitutes the southern side of this mountain, the latter the northern flank. In both these cases, and in others observable in the same district, the present appearances may be due to the disturbance of the whole mass, amounting sometimes to a complete overthrow.

A very extensive district in the Tyrol, between Botzen and Trent, more particularly to the left of the Adige, is occupied by porphyry, which has greatly disturbed the stratified rocks of the district. Von Buch supposes that much of the dolomite of the Tyrol is a rock altered by its contact with the igneous matter which has broken in upon it. Another district, the shores of the Lake of Lugano, particularly Monte San Salvadore, affords, according to this author, a confirmation of his views in this respect, as the limestone of the mountain becomes dolomitic in its approach to the augitic porphyry of Melide.

Among the other igneous rocks of the Alps, we may notice those in the Vallée de Fassa, where they are singularly mixed with dolomites and limestones, and have supplied a great variety of minerals. Respecting the Alpine serpentine and diallage rock, it is difficult to say, in the absence of good data, whether they should, like the mass of that in the Apennines, be considered of igneous origin, shot up among the stratified rocks, or as having been originally produced among the system of gneiss, mica slate, and others of that character. These rocks are found in the largest masses at the Monte Rosa, Mont Cervin, &c. At the Passo d'Olent, on the southern flank of the former, the mass composed of them is more than two leagues in extent.

Scattered on either side of the Alps, and down the principal valleys, we find huge blocks of rock, evidently detached from the great central range, and frequently accumulated in considerable numbers. It is clear that these principal valleys existed prior to the passage of the blocks, and that they were transported by means of water, for they are lodged against those parts which would oppose obstacles to the passage of waters, and often occur in great numbers precisely where eddies would be produced. These erratic blocks, as they have been termed, have long engaged the attention of geologists, and it has been found that, by tracing them up the principal valleys which they either face or occur in, the parent rocks from which they have been detached will be detected. Numbers of these blocks are discovered on the flanks of the Jura facing the Alps, and have evidently been borne down through the principal valleys into their present situations by water which must have been at a level of at least 2400 feet on those flanks, as erratic blocks are discovered at that height. The size of the blocks varies materially: there is one, among others, on the Vigneule, near Bienne, which is 12 feet high, 30 feet long in one direction, 24 in another, and 18 in a third. The blocks detached from the heights of the Mont Blanc district, and borne down the valley of the Arve, are found upon the Saleve, (near Geneva,) which opposed their progress, to the height of 2760 feet. Numbers of erratic blocks are accumulated upon the shores and the hills round the Lake of Geneva. One of large size, now known as the Pierre à Niton, (once as Ara Neptuni, being dedicated to Neptune,) occurs in the lake near Geneva. The Pierre à Martin, on the hill of Boisi, is 22 feet high, 18 feet wide, and 26 feet long. The erratic blocks are also abundant on the southern side of the Alps. They cover by thousands the northern face of the Monte San Primo, a mountain facing the high Alps on the Lago di Como, where it branches off into the minor lake and the Lake of Lecco. Behind that mountain also, and precisely where eddies would be formed under the supposition that they have been brought by a body of water from the high Alps on the north, they are abundant. They are observed curiously perched upon the flank of the Monte San Maurizio above Como. Many theories have been framed to account for the present situations of these blocks. That they have been water-borne is generally agreed, and that they have been carried outwards from the central Alps at a geological epoch comparatively recent, seems also undisputed, but geologists do not so well agree as to the cause which set them in motion. In all discussions on this subject it should be remembered, that the present glaciers are covered by huge blocks which fall from the heights upon them, and that if these glaciers were floated and carried down by a great body of water through the valleys opened to them, the blocks might become scattered as we now find them.

ALPS.—The *Vegetation* of the Alps differs in many respects from that of the plains beneath. Every traveller who has crossed into Italy knows that the beauty of the meadows and of the rich turf increases as he ascends the mountains; and gardeners have a whole class of Alpine plants. Some idea of the nature of Alpine vegetation has already been given under the head of ÆTNA; we shall in this place make a few general observations upon the subject.

As we quit the base of the Alps and rise into the higher regions, we find the temperature gradually diminish, and this phenomenon is accompanied by the disappearance of certain trees, the absence of which, as producing a striking effect upon the scenery, is one of the first circumstances that is usually noticed. At the foot of the Alps, for instance, are rich vineyards, and wine is one of the staple products of the country; the forests consist of most of the common European trees, especially of sweet chestnuts, oaks, birches, spruce firs, and many sorts of pines, while the usual proportion of bushes is scattered among them. But at the low elevation of 1950 feet, the vine is no longer capable of existing; at 1000 feet higher sweet chestnuts disappear; 1000 feet farther, and the oak is unable to maintain itself; at the elevation of 4680 feet, less than one-third of the height of Mont Blanc, the birch as well as almost every other deciduous tree ceases, the spruce fir alone attains the height of 5900 feet, after which the growth of all trees is arrested, not by perpetual snow, which does not occur for more than 3000 feet higher, but by the peculiar state of the soil and air. At the line where the spruce fir disappears, the mountains are ornamented by the *Rhododendron ferrugineum*, which covers immense tracts like our English heath and furze; but even this hardy mountaineer cannot ascend beyond 7800 feet. The herbaceous willow creeps two or three hundred feet higher, accompanied by little except a few saxifrages and gentians and grasses, which struggle up to the imperishable barrier of eternal snow, on whose border lichens and mosses and the most stunted and imperfect forms of vegetation alone exist.

Changes of a less striking but not less important kind simultaneously occur in the herbage of the Alps; their limits are, however, far from being so well defined as those of the trees, neither have they in the same degree occupied the attention of botanists. The middle region of vegetation on the sides of the Alps is that which is richest in the peculiar flora of such regions; it is here that the numerous species of pedicularis, the gentians with their vivid blue, the white or purple neat-leaved saxifrages, with the gay-flowering euphrasias, and the alpine compositæ find their principal station; what lowland forms are there associated with them gradually cease to grow as the snow is approached, till at last the region is occupied by strictly mountain plants alone.

The causes of this difference between the vegetation of the foot and of the summit of the Alps is doubtless owing to several circumstances combined. By many writers diminished *atmospheric pressure* has been thought a principal cause of the effects we have described; that it is a powerful *concurring* cause is highly probable, but, unconnected with others equally important, it is difficult to suppose that it can produce any very great effect; for the only way in which we can understand it to act is, firstly, to augment evaporation, in consequence of the rarity of the air, and, secondly, to diminish the supply of oxygen.

Temperature is doubtless here, as in every thing else, second to nothing in its influence. At the foot of Mont Blanc, the mean temperature of the year is 53° Fahr.; at the height of 6695 feet it is 32°; and between these points, as well as beyond the latter, the temperature of the year is in due proportion. By this plants are essentially affected; and the vine and chestnut, for instance, are probably stopped by it alone.

Light, again, is a third agent, to which the peculiar nature of alpine vegetation is due; for it is under the action of light that plants feed, (that is, decompose their carbonic acid,) and the quantity of food they are able to digest is in proportion to the intensity of the light to which they are exposed. Constant darkness during the state of rest is a condition to which alpine plants are periodically subject: buried in snow, they remain cut off from every ray of light during the whole of the winter, and it is only when the snow melts, and the spring has really commenced, that they again emerge into day. Now light, among other things, is the great stimulator of the vital actions of plants: if applied when they are able to execute their functions, it is of the most essential service to them; but if its influence is exercised only at intervals and at unfit seasons, plants are alternately stimulated and checked till their very excitability is itself destroyed, and thus they perish; or they are excited prematurely into growth, and are cut off by succeeding cold. Plants of the plains accustomed always to a certain amount of light are not very excitable, and therefore do not suffer from constant exposure to the weak light of winter; but those of the mountains, never feeling a ray of the sun during the whole of their long winter, are excitable in the highest degree.

Humidity of the soil, gentle, but perpetual, never stagnant, but in a constant state of renewal by the melting of the snow, is the fourth circumstance that may be supposed to cause the peculiar appearance of the flora of the Alps. Under such circumstances no drought can be known, and a flood only sweeps over the surface, leaving nothing but its nutriment behind.

Such are, as far as we at present know, the conditions under which the botany of the Alps is produced. They should be attentively considered by gardeners, if they would possess the lovely flowers of the Swiss mountains, or, indeed, of any other mountains, in perfection; for the most skilful cultivation is that which most nearly resembles nature in her operations.

ALPUJARRAS, a smaller chain of mountains in Granada, lying between the Mediterranean and the Sierra Nevada or principal chain, to which the Alpujarras are parallel. They run between Motril and Almeria, a distance of about 60 miles. their rapid descent is on the north side; that towards the sea is long and gentle. The highest point of the Alpujarras is about 5000 feet. The mountain country is in general barren, but furnishes some pasture for sheep. It is said that the Alpujarras contain many thousand descendants of the Moors, who took refuge there after they were driven out of Granada.

AL RASHID. [See Abbasides.]

ALRESFORD, NEW, a market town in the County of Hants, on the river Itchin, fifty-seven miles from London, on the high road to Winchester. It was formerly a town of far greater importance than at present, and sent a representative to parliament. It probably owed its prosperity to the circumstance of the river having been rendered navigable by a head or pond of 200 acres, formed by Godfrey de Lacy, Bishop of Winchester, early in the thirteenth century. At present the navigation does not extend above Winchester, and is there confined to a few barges.

During the present summer, (1833,) a large quantity of English silver coins, all of the reign of William the Conqueror, were found in a leaden box in a field a short distance from this town. About 7000 of these coins are now in the British Museum.

It has been twice destroyed by fire, once in 1690, and again in 1710. It has a manufactory of linseys; the population in 1831 was 1437, or if we include that of Old Alresford, a village in the immediate neighbourhood, and which some consider as another parish of the same town, it may be taken at nearly 1900. Alresford has a national school. The market, which is held on Thursday, is chiefly for corn.

ALSACE, a fertile province of France, comprehending part of the basin of the Rhine, by which river it is bounded on the east. The Vosges, or Wasgau mountains, form the western boundary, and separate it from the ancient district of Lorraine [see Vosges]; a continuation of the chain of Jura divides it from Switzerland on the south; on the north it extends to that part of the Bavarian territory which is west of the Rhine. It is nearly equivalent to the present departments of Upper and Lower Rhine. It is watered by the various streams which flow from the above-mentioned mountains into the Rhine; but none of these attain any size, except the Ill, which has a course of about eighty English miles.

The Rauraci, the Tribocci and the Nemetes, the two last German tribes, were the ancient occupants of this district, which passed with the rest of Gaul under the Roman yoke. Upon the rise of the Frankish monarchy, under Clovis, it fell into the hands of that prince; and after his dismembered territories were reunited under Charlemagne, it was included in the empire of that prince. When that empire, after many convulsions, was divided, Alsace became part of the German empire, and continued so until the seventeenth century. By the treaty of Munster in 1648, a considerable part of it was ceded to France, and nearly the whole of the remainder by the peace of Ryswick, in 1697. The territories of Montbelliard and Mühlhausen have been acquired by France since the revolution. German is still the common language of the country; but the French is generally understood, and is spoken in the towns among the more educated classes.

Alsace is a fruitful country. Corn, wine, flax, tobacco and madder, are produced. It is thickly wooded. The forests in the Vosges produce firs in abundance, with beech, oak, and hornbeam. The mountains on the side of Switzerland are lower and well wooded. The horses are suited for cavalry and posting.

The wealth of the country chiefly arises from its mines and manufactures. It yields copper, iron, lead, and coal; and near Soultz sous Forêts, in the northern part, is a spring, from which a considerable quantity of salt is obtained. Seltz, another town in Alsace, exports many thousand casks of mineral waters to Paris and elsewhere. The staple manufacture appears to be cotton; other woven goods, linen and woollen, are also made; and the mineral riches of the district have made it the seat of a considerable manufacture of swords, fire-arms, and other hardwares.

The inhabitants are distinguished by their adherence to a peculiar dress, and to old customs and manners. The chief towns are Strasburg, Colmar, Mühlhausen, and Schlettstadt (which see); for the rest, as well as for other particulars, we refer to Upper and Lower Rhine.

ALSEN, a small island in the Baltic, belonging to the duchy of Schleswig and the kingdom of Denmark. It lies in the Little Belt, and is separated from the main land only by a narrow channel. It is about 20 miles long, and from 3 to 8 broad. The 55th parallel and 10th meridian E. long. pass through the island. The soil is very fertile, and produces grain, fruit, potatoes, and flax, some of which form articles of exportation. The island is one of the most pleasant in the Baltic, containing some fine woods and small fresh-water lakes, well stocked with fish.

Sonderborg, the chief town, is on the south-west coast of the island situated on the slope of a hill, and is a place of some antiquity. It has one of the best ports in Denmark, and about 3000 inhabitants.

The population of Alsen is stated at about 15,000.

AL-SIRAT (*i. e.* literally, 'The Path'), in the theology of the Mohammedans, is the name of a bridge extending over the abyss of hell, which must be passed by every one in order to enter paradise. It is described as being narrow like the edge of a sword. Some, it is said, will pass it with the rapidity of lightning, others with the swiftness of a horse at full gallop, others like a horse at a slow pace others still slower, on account of the weight of their sins, and some will fall down from it, and be precipitated into hell.

ALSTON, or ALDSTON, a town almost at the eastern extremity of Cumberland, in a mountainous and sterile district, which contains rich lead mines; many of these mines at present belong to Greenwich Hospital, having been forfeited by the Earl of Derwentwater, who was engaged in the rebellion of 1715.

Alston is on the declivity of a hill on the bank of the South Tyne River, over which is an ancient and narrow stone bridge of one arch. The houses are chiefly of stone and roofed with slate; the town has one church, rebuilt in 1790, and there is a chapel-of-ease at Garrigill, four miles S. E. of the town. There are also a Presbyterian, a Quaker, and two Methodist (Wesleyan and Primitive) meeting-houses. The grammar-school was erected in 1828, but the endowment appears to be much older. There is a similar school at Garrigill; and at Alston a Lancasterian school for 200 children. The market day is on Saturday, and there are three fairs in the year, in May, September, and November.

The mines of the neighbourhood supply some copper, and a little silver is extracted from the lead-ore. But the lead is the principal metal obtained, and it is said that the present supply is about 9000 tons per year. Alston is, by the nearest road, 272 miles N.N.W. from London, and 25 E.S.E. from Carlisle. The population of the parish, including the chapelry of Garrigill, was, in 1831, 6858.

There are some Dissenting meeting-houses and an Episcopal chapel. Considerable sums were left by Lady Charlotte Erskine for educating and catechising the children of the town, and supporting schools about the collieries. Lat. 56° 7′ N., long. 3° 46′ W. of Greenwich.

ALT, in Music, (from the Latin *altus*, high,) that part of the scale beginning with F, the fifth line in the treble clef, and ending at E, the third leger, or additional, line above the same clef.

ALTA, in Music, (Italian, *high*,) generally used in addition to the word *ottava*, as *ottava alta*, an octave higher, *più*, more, being by custom omitted.

ALTAI MOUNTAINS is the name given to that extensive range which forms the northern border of the *high lands* of Upper Asia, (a region composed of high table-lands, mountains, and valleys,) and which divides them from the *low lands* that extend northwards to the arctic ocean.

This mountain-range begins on the eastern banks of the *River Irtish*, 80° E. long., and here it occupies all the space between the *Lake of Zaizang*, (47° 30′ N. lat.) and *Semipalatinsk* (53° N. lat.), consequently, about 5½ degrees of latitude. From 80° E. long., it extends eastwards till it reaches the *Sea of Okhotzk*, a gulph of the Pacific ocean. It grows broader as it advances towards the east; its northern declivities extend, on the banks of the river Yenesei, to Krasnoyarsk (56° N. lat.), and from that town to a point about 200 miles north of the most northern extremity of the *Lake of Baikal*, where, between 57° and 58° N. lat. they join the *Aldan Mountains*. How far this range extends to the south is not exactly known, as it traverses countries subject to the Chinese empire, whose jealous politics exclude foreigners from their dominions. But as far as we may judge from the geography of the imperial court of Peking, the ranges of the Altai Mountains extend even farther to the south than to the north; and it is probable that, between the meridians of 88° and 105°, the mountains occupy no less than 12° of latitude, from 45° to 57°, a distance equal to that between the Pyrenean Mountains and the Cheviot Hills, or the whole extent of France and England from south to north. About the 105th degree of longitude, or the meridian of the lake of Baikal, the great Desert of Gobi, or Shamo, advancing to the north, narrows the mountain-range considerably, and changes its direction from east to north-east. Between the plain to the north of *Irkutzk*, and the valleys about Nertshinsk, it occupies not more than about 500 miles in breadth. In the parallel of the northern part of the lake of Baikal, (*i. e.* between 54° and 56° lat.) it runs again to the east till it arrives at the Pacific Ocean, at the southern extremity of the sea of Okhotzk, opposite the island of Tarakai. In this latter part of its extent, the breadth of the range cannot be determined; for here it joins the Aldan Mountains, which may be considered as a branch of the Altai, nearly filling up the whole space between the *Lena* and the Sea of Okhotzk, an extent of more than 1000 miles from west to east, and running to the north-east, till they terminate at *Cape Tshukotshoi-Noss*, the north-eastern extremity of Asia.

If we consider the Altai Mountains to terminate at the southern extremity of the sea of Okhotzk, their whole length from the banks of the Irtish to that point is equal to 62°, or about 2480 miles (at forty miles the degree); and if we add the Aldan Mountains, which extend obliquely, between the parallels of 55° and 67°, and the meridians of 135° and 190°, we may still add about 2000 miles, so that the whole length of the Altai Mountains may be esteemed to amount nearly to 4500 miles.

Our knowledge of this immense range of mountains is very imperfect, and as the principal parts are subject to the Chinese empire, even their geographical position would be entirely unknown, had not the Emperor Kang-hi, in the beginning of the last century, employed some Jesuits to survey part of these countries. Their surveys were sent to Europe, and used by D'Anville in his *Nouvel Atlas de la Chine, de la Tartarie Chinoise et du Tibet : à la Haye*, 1737, fol. About ten or twelve years ago, the archimandrit Hyacinth brought from Peking the *Tay-thsing-y-thoung-tshi*, or the *Great Imperial Geography of the Dynasty of the Mandshu Race*, published at Peking, in 1790. This work was translated and explained by Klaproth, and by means of it, and the information furnished by Pallas, Meyer, de Ledebour and Humboldt in Siberia, we are able to form a general, though doubtless still imperfect and inexact view of these mountains.

It was once thought that the Altai were connected with the Ural mountains, as well as with the *Thian-Shan*, a range which traverses the interior of Asia in the parallel of 42°. But according to the Geography, the latter supposition is not probable, and it is very well known that an immense tract of low country separates the western extremity of the Altai from the southern ranges of the Ural.

It is true, that on the left bank of the river Irtish, and opposite the western extremity of the Altai mountains, between 49° and 50° N. lat., a range arises, which extends from east to west for upwards of 700 miles to the 64th meridian. Though composed of several chains running parallel to one another, the mountains do not occupy a great space from north to south· their height is reckoned by Humboldt to be from 1200 to 1600 feet; but Dr. Meyer thinks that one summit, the *Kar-Karali*, rises to 3000 feet above the level of the sea, or 2000 above the steppe of the Kirghis, which extends on its northern side. This range, however, ceases entirely in the meridian of 64°, so that between it and the nearest range of the Ural, which is called *Mughodjar Kara Edir Tau*, nearly 10° of a flat country intervene, covered with a great number of lakes. This smaller continuation of the Altai mountains is called *Tshinghis-Tau*.

There is still another branch, more important in every respect, the *Tarbagatai*. Its north-eastern extremity is about twenty miles distant from the Lake Zaizang; whence it extends towards the south-west to the neighbourhood of the Lake Balkhash, a line of nearly 500 miles. It rises to a much greater height than the Tshinghis-Tau. In some places, on its north-western summits, snow, it is said, lies all the year round, which indicates, in this parallel, an elevation of about 6000 feet above the level of the sea. A chain of low hills, running at a distance of about twenty miles along the southern banks of the Lake Zaizang, unites this range to the Altai mountains. The Tarbagatai is considered as forming the north-western boundaries of the empires of China and Russia.

The *Altai Mountains* occupy, as we above observed, uninterruptedly, the whole space between the right bank of the river Irtish, a tributary of the Ob or Oby, to the southern extremity of the sea of Okhotzk. The most western part of this great range, between the Irtish and the Tshulyshman, the most eastern tributary of the Ob or Oby, all the space between the meridians of 80 and 86, consists of one extensive mass of high rocks, furrowed by narrow valleys and rapid rivers; this part is called by Ritter the *Egtag Altai*.

To the east of the Tshulyshman, between the meridians of 86 and 87, the great mountain mass divides into three distinct ranges, of which the central, called the *Tangnu Oöla*, extends nearly due east, under the parallel of 49°, bending a little to the south, and terminates at the mountains which inclose the Lake of Baikal and its southern tributaries on the west. The northernmost chain, called the *Sayans kean*, or *Mountains of Sayan*, runs W.N.W. of the Yenesei, but, on the right bank of that river, resumes its eastern direction, which towards the mountains on the south-west of the Lake Baikal inclines to the south, and in this direction it joins the *Baikalean Mountains*. This chain forms the boundary between Russia and the Chinese empire. The most southern chain, called *Ulan gom Oöla*, deviates to the south, but soon resumes its eastern course, and running nearly parallel to the Tangnu, reaches the Baikalean mountains farther to the south, in the parallel of the sources of the *Orkhon*. All these three chains join, between the meridians of 98 and 102, the mountains that encompass the great Lake of Baikal, and are called the *Baikalean Mountains*. The Chinese Geography calls those to the west of the river Orkhon, *Kangai*, and those on the east, *Kentei Mountains*. These Baikalean mountains may be considered as an extensive mass, in the middle of which is the lake.

To the east of the Lake of Baïkal, between the meridians of 108 and 109, the chain that shoots out from the Baikal runs for a few degrees N.E., after which it follows an eastern direction till it reaches the Pacific. This chain is called by the Russians *Yablonnoi Khrebet*, and *Stannowoi Khrebet*, and by the Chinese *King-han-Oöla*.

The *Egtag Altai*, or that system of mountains in which the tributaries of the *Irtish* and *Oby* take their rise, is better known than any other part of the Altai. It occupies 6½° of lat., and 6° of longitude, consequently much less than half the extent of the Alps from east to west, but more than three times their range from north to south. The greatest elevations are between the parallels of 50 and 51, where, on the *Korgon table-land*, they rise to near 9900 feet above the level of the sea (Humboldt), or more than 3000 feet above the line of eternal snow. But their mean height ranges between 4000 and 6000 feet, and consequently only a few places of considerable extent are always covered with snow. No glaciers are formed on them.

Compared with the mountains of Europe, the Altai Egtag exhibits a peculiar character. Whilst the highest parts of the Alps are peaked, rugged, and irregular, the summits of the Altai are nearly level plains of considerable extent. Some of them spread twelve and sixteen miles in every direction, as on the Korgon table-land These table-lands may be considered as broad rays issuing from one common centre between the sources of the rivers *Bukhtarma* and *Tshuya*, and extending west, north, and east. The mountain-plains, where they have no snow upon them, are commonly covered with swamps, interrupted by some ridges of low rocks and lakes filled with snow. Rarely a peak 100 feet high rises above them; but in many places great pieces of granite are scattered about, which are often so scarped, that the snow which covers the plain does not stick to them, and thus their dark masses offer some variety in the uniformity of the scene. This characteristic formation, though different from that of the mountains of Europe, seems to be common to all the ranges of Asia, and indeed to belong to the nature of the steppes which prevail in that part of the world.

The valleys which intersect these mountains differ no less in their formation from those of the great European mountains, They commonly take the form of large, oblong, flat basins, with gradually-sloping sides, each basin being followed by another somewhat lower. The course of the rivers in these valleys is slow, and only becomes rapid where they descend from one basin into another. But as the extent of the whole range is considerable, and its mean height only half that of the Alps, the rivers have rarely a rapid course, and still less rarely do they form cataracts. These facts will explain the want of those majestic and beautiful views, which the traveller meets at every step in the Alps. The Altai upper valleys are commonly without thick forests, and only covered with a few trees and grass. But as these mountains are everywhere surrounded by extensive and dry steppes, they make an agreeable impression on the traveller who arrives at them. The valleys, which open to the west, on the bank of the Irtish, however, have steeper sides, and offer more variety than those turned to the north or east.

All the rivers which rise in these mountains contribute their waters to one stream, the Ob or Oby, which may perhaps be considered as the largest river of Asia, with the exception of the *Hoang-ho* and *Yantse-kiang*. Those that descend from the northern declivity join the main stream; those that issue from the western sides fall into its large tributary, the Irtish.

The Irtish (Ertshis of the Mongols) has its numerous sources on the south-western declivity of the Altai; its waters take a westerly course, and fall into the lake of Zaizang, 70 miles in length, and about 200 in circumference. Issuing from the north-western extremity of the lake, the river runs along the western declivity of the Altai mountains nearly due north, up to the place where the Bukhtarma joins it. Here the mountains advancing farther to the west, oblige it to change its course to the north-west, which direction it preserves till it leaves the mountains to the north of Semipalatinsk. Here, running to the N.N.W., it enters the low lands of Siberia, and traverses the steppes of *Ishim* and *Barabinsk* up to the town of *Tara*, whence it again directs its course to the north-west, and after having joined the *Ishim* meets the *Tobol*, descending from the Ural, after the junction of which it runs to the north, and mingles its waters with the Oby. At their junction, the Irtish is rather the larger river, but its name is merged in that of the Oby.

Among the rivers which descend from the Altai and join the Irtish, the *Narym*, the *Bukhtarma*, and the *Uba* are the most remarkable. The Narym is rather a small river, running little more than 100 miles, but it is remarkable as forming near its junction with the mouth of the Irtish the boundary between the empires of Russia and China. The sources of the Bukhtarma are in the Chinese territories, and not known but from Chinese maps: this river seems to run upwards of 400 miles; which is also confirmed by the statement of the natives. It also forms for some distance the boundary of both empires. The Uba joins the Irtish before it enters the low lands, after a course of between 200 and 300 miles.

The numerous rivers which rise in the eastern parts of the Altai mountains, and form the Oby, unite before their junction in two considerable rivers, the *Katunya* and the *Biya*, of which the former receives all the waters collected in the central region of the mountains, and the latter those which descend from its eastern parts. The river Katunya, before it leaves the mountain region, mingles its waters with those of the *Tshuya*, a river which runs at a great distance in the Chinese territories; and the Katunya, on entering the low land, receives another considerable river, the *Tsharysh*, which carries with it all the waters collected between the tributaries of the Irtish and those of the Katunya. It enters the Katunya on the left, and the united stream runs to the north, and joins the Biya.

The Biya, which comes from the east, has comparatively a short course, and may be considered as the channel by which the Alpine *lake of Teletzkoi* or *Altyn Nor* discharges its waters. This lake, which is everywhere inclosed by high mountains, and has only been seen by one traveller (de Bunge), receives a considerable river, the *Tshulyshman*, which rises to the south of the boundaries of the Russian empire, and, according to the Chinese maps, has its sources at a considerable distance in their country.

After the junction of the Biya with the Katunya, the river takes the name of *Oby* or *Ob*. It then runs to the north-west for a great distance, nearly parallel to the Irtish, but afterwards changes its direction to the north-east, until, below the town of *Tomsk*, it gradually inclines to the north, north-west, and west. At its junction with the Irtish, it again is turned to the north, in which direction it continues till near its embouchure in the Arctic Ocean, where it forms a large gulph. Its whole course is thought to amount to upwards of 2000 miles.

In the Altai mountains, as in the Alps, the general direction of the valleys follows that of the main range. Nearly all of them run from east to west, or *vice versâ*, and are only united by a few transverse valleys, in which the rivers run which carry off the water to the low lands. Besides the Irtish, only four such rivers cut the northern declivity of the mountains, three of which we have already named the Tsharysh, the Katunya, and the Biya. The fourth, called the *Anui*, is much less considerable, and runs between the Tsharysh and the Katunya, and joins the former.

Our geological knowledge of this mountain mass is very imperfect. The following facts, collected by a practical miner, and able observer of nature (Mr. Shangin), refer to the geological formation of the mountains in the valleys of the Tsharysh, and of the *Korgon*, a tributary of the former.

The summit of the mountain-mass is covered with a breccia of jasper, mingled with pieces of chalcedony, carnelian, &c., and under it lies a bed of slate-formation only two feet thick. This rests on a bed of breccia of red jasper, which contains many pieces of jasper of a darker colour, and is about sixty feet thick. Then follows a pure red jasper. In the lower part of this jasper a few cubes of felspar are inclosed, but they are of very small size, and the lower down the more frequent is the appearance of such cubes. These layers occupy about 300 feet of perpendicular depth, and have a substratum of the most perfect red porphyry, containing white and yellowish cubes of felspar, among which the very small cubes of felspar above-mentioned are disseminated. Sometimes the breccia is found between the jasper and porphyry, and at others the jasper is found between the beds of porphyry, or the porphyry between those of jasper, but these formations only occur at the external and remoter protuberances of the mountain-mass. The granite is never found over the porphyry, chalk, or slate; the chalk likewise does not appear on the summit, but only in a few places calcareous hills join the mass, especially those which contain the coralline species. The granite is only visible on the lower part of the mountains, where it forms regular strata dipping somewhat towards the principal valleys.

This is the formation of the mountain-mass near its centre, but on its outskirts, near the lake of Kolywan, the granite-formation, for about ten miles, is unaccompanied by any other rocks, and only when it approaches the centre do we find the naked irregular summits formed by black porphyry. On the western edge of the mountains along the Irtish and the Bukhtarma, the granite likewise occupies the exterior heights, and behind it rise higher mountains composed chiefly of greenstone slate. Here the granite forms thick layers nearly horizontally stratified, but also split nearly at right angles, so as to form rhomboidal figures; and it is observed that its surface is much affected by the air and greatly decomposed. In the same quarter Humboldt observed a district extending more than 16,000 feet in length, on which the granite, lying horizontally, has been burst through by a mass of porphyry which now overtops it; while the granite covers on the sides of the porphyry great masses of argillaceous slate, which in part form an angle of 85°, and in part stand in an entirely vertical position.

All these facts concur to prove that the porphyry masses covered with layers of jasper have been heaved up by a powerful agency through the granite lying on them; but as the granite has great hardness and weight, it was not carried to the top, but fell down on all sides, where at present it rests, and in some parts covers the slate-formation that formerly lay upon it.

Humboldt recognized the same geological formation in the *Tshinghis-Tau*, which ridge he considers as an effort of nature to raise on the steppes a mountain-mass of the same description, and in the same direction as the Altai. This mountain-range shows likewise granite in regular layers and without gneiss, argillaceous slates and slates of grauwacke in contact with greenstone, porphyry, and jasper in layers, close-grained transition limestone, and even the metallic riches which are found to the east of the Irtish; among the latter, the lead-ore containing silver, and the red copper-ore with dioptas has attracted the attention of mineralogists

The produce of the mines of this district consists of silver containing some gold, copper, and lead. The mines from which these metals are extracted have been worked on a large scale, at some unknown period, and by an unknown nation. In the middle of the last century the Russians began to work them. The mines which were first worked are all situated within the northern edge of the mountain-mass, and at no great distance from it; but gradually they became exhausted, whilst towards the close of the last, and in the course of the present century, very rich mines have been discovered on the western side, on the banks of the rivers that fall into the Irtish, and, according to all appearance, many more will be found in that quarter.

The principal mines are, 1. *That of Syranow* on the southern banks of the Bukhtarma, about forty miles from the Irtish, and not far from the boundary of the Chinese empire; it produces considerable quantities of silver and lead. 2. The *mines of Riddersk* and *Krukow* on the banks of the *Ulba*, which joins the Irtish between the Bukhtarma and Uba. They produce silver and lead, and are at present the richest in this quarter. 3. The *mines of Semenof*, farther to the north-east, on the lower ridges of the range, produce silver and copper, but are not considerable. 4. The *mines of the Schlangenberg*, famous for the great quantity of silver which in the last century was got from them, likewise on the northern lower ridges of the mountain-mass to the west of the river Tsharysh. It is remarkable, that the metalliferous veins are here imbedded in rocks of dark porphyry. In many mineralogical collections very fine specimens of gold-ore, silver-ore, and copper-ore, brought from these mines, are met with, but at present their produce is less considerable, and they begin to be exhausted. 5. The *mines of Woskresensk*, which produce copper, are at present not worked. 6. The *mines of Loktewsk*, to the west of those of the Schlangenberg, produce a great quantity of copper. In the neighbourhood of these mines, Pallas discovered in the sandy banks of a small river teeth of elephants, of rhinoceros, buffalos, and antediluvian animals: this is a single instance we believe in this mountain-range, though frequently met with in the low lands.

The quantity of silver extracted from the *Kolywan* mountains, as they are called by mineralogists, amounts annually to 1000 puds, which are nearly equal to about 36,000 pounds weight; but the quantity of copper and lead is not known. The former is in part coined in Siberia, in the mint of Susansk, on the bank of the Oby.

We may here notice the extensive *polishing works* at Kolywano-Woskresensk, where the finest granites, porphyry, jaspers, agates, and marble, brought from the river Korgon, are worked into tables, vases, basins, chimney-pieces, columns, &c. They employ 300 workmen, and are carried on at the Emperor's cost.

The *botany* of this mountain-region has only in a few places been examined with care, but has enriched our knowledge with some species, as cimifuga fetida, trollius Asiaticus, &c. On the low banks of the Irtish and other rivers, poplars, willows, loniceres, (*Lonic. tartarica*,) medlars, privets, white thorns, wild roses, and other bushes are found in abundance. In the lower parts of the valleys grow different kinds of poplar, birch, willows, hawthorn, *Lonicera tartarica*, currants, and some kind of roses. The slopes are covered with large forests of larch, mingled with birch, fir, &c. Birch ceases to grow at 4500 feet, but other forest trees extend nearly 1000 feet higher. Higher up, only *Pinus cembra*, *Pinus larix*, and *Juniperus sabina* and *nana* are found. But the larch, though still from 9 to 12 feet high, is stunted in its growth, and the other trees are dwarfish, and extend their branches along the ground. The *Pinus cembra* was found 6187 feet above the level of the sea. On the table-lands of the summits, only a few dwarfish firs are found.

The dried leaves of the *Saxifraga crassifolia* are used in Siberia and other parts of upper Asia as a substitute for tea. They are chiefly gathered in the valley of the Tsharysh on a mountain, which, on that account, is called by the Russians *Tshaynaya Sopka*, the 'Tea-mountain.' The leathery, spongy leaves of this plant fall off in the fourth year, when those only are gathered which are quite black. They require no other preparation to be used. The infusion is reddish and of an astringent taste, similar to that of tea, but the aromatic flavour is wanting.

Agriculture was introduced into the valleys of this mountain-range about 100 years ago, and its progress has not been rapid. The best cultivated places are near the mines, or the towns which have sprung up in their neighbourhood. But in no part is cultivation carried higher than 4000 feet above the level of the sea. Rye, spring-wheat, buck-wheat, barley, oats, and millet; and cabbages, onions, gherkins, poppies, and pumpkins, are the chief grains and vegetables cultivated.

The natives of this mountain-region are altogether occupied with their cattle, which they conduct in spring to the high table-lands, which then give good pasture, and in autumn to the banks of the rivers. Their cattle are chiefly horses, sheep with fat tails, and a few camels. From the milk of the mares they make an intoxicating beverage, called *cumiss*.

The wild animals of these mountains are numerous. Bears abound in every part, as likewise elks, stags of a large size, red deer, wolves, foxes, lynxes, sloths, mountain-hares, (*Lepus alpinus*,) and squirrels; and on the rivers beavers, which, however, at present are less frequently met with, and otters. The best furs are obtained from the sables, which here are small and with a short hair, but their black skins are much valued; and also from martins, and from kulonkis (*Mustela Sibirica*). The highest parts are inhabited by the *musimon*, and the argali, a kind of wild goat. It is not ascertained whether or not the wild goat of the Alps, the dshiggetai (*Equus hemionus*), and the wild ass are to be included in the zoology of these mountains: the chamois does not occur.

The variety of birds is not great. The most remarkable bird is the mountain swallow (*Hirundo alpestris*, or *daurica*, Pall.) which makes its nest in the hollows of rocks.

Many people living on the banks of the rivers gain a competent livelihood and even riches by fishing. The most important are the fisheries in the river Irtish, and the Russians, by the connivance of the Chinese governor in these parts, extend them over the lake of Zaizang up to the sources of the Irtish. In the lake, and the small rivers falling into it, some kinds of salmon, (*Salmo nelma*, Pall. and *salmo fluviatilis*,) quabs or eel-pouts, (*Gadus lota*,) and pike are taken. The latter are also found lower, where, however, the sterlets (*Accipenser ruthenus*) and the sturgeons (*Accipenser sturio*) are very abundant. The former are often two feet long, and the latter weighs sometimes two or three puds (at about thirty-six pounds English each). Of the former 3000, and of the latter 30,000 fish are annually taken. Isinglass is made of their air-bladder.

Mosquitoes, in summer, are so numerous in many places, that they torment both men and animals, especially in the low lands. When Pallas, about sixty years ago, travelled in this country, he found no bees there; but they were soon afterwards introduced, and have so rapidly increased, that many peasants along the Irtish and other rivers now possess from 50 to 100 beehives, and consider them the best part of their fortunes. The introduction of these insects is the greatest benefit the Russians have conferred on these countries, next to the introduction of agriculture.

No mountain-chains run from the Egtag Altai to the north; but the Chinese Geography describes a very long and high mountain, which, parting from the south-western end of it, traverses a great part of the country between the Altai mountains, and the Thian-shan-Oöla. It assigns no name to it, probably because it considers these mountains as the true Altai, and the mountain-mass which we have till now been describing as its most northern extremity. Therefore the name of *Great Altai*, which in our maps is given to a mountain-chain which does not exist, may with propriety be transferred to this range.

The Great Altai joins the Egtag Altai at the sources of the Narym, (whose course, as we have already observed, forms for some distance the boundary between the Russian and Chinese empires,) and runs for a considerable distance to the south, or south-east, with some bends. The chain then turns to the east till it arrives at about the 92nd or 93rd meridian, where it divides into two branches, which form the boundary-edges of the desert Gobi or Shamo. Here they do not appear like mountain-ranges, but are only black rocks of inconsiderable height, whose continuity is often broken and interrupted. The chain of rocks which runs to the north-east is called *Kooke Sirke Oöla*, and joins the Baikalean mountains. The other chain running to the south-east bears several names, and seems to cease not very far from the place where the Thian-shan Oöla joins the Great-Desert.

According to this description, the Great Altai, before it joins the desert, runs for many degrees of longitude parallel to the *Ulangom Oöla*, and as they are some degrees of latitude distant from one another, a valley of great extent is formed between them, which is every where inclosed by high mountain-ranges. This valley is watered by two considerable rivers, of which the larger, *Zabgan*, rises where the Kooke Sirke Oöla joins the Baikalean mountains, and runs for about 200 miles to the south-west, receiving the waters of many rivers which descend from the Great Altai and the Ulangom Oöla. It then changes its direction to the north-west, and after a considerable course falls into the Kirghis-Nor, (lake of the Kirghis,) which, according to the Chinese Geography, has a circumference of upwards of 100 miles, and lies at the foot of the Ulangom Oöla. The other river is the Khobdu or Khobdo, which takes its rise in the Egtag Altai, and after running to the south-east along the eastern declivity of the Great Altai, falls into the *Yke Aral Nor*, or *Ekaral Nor*, a lake not much less than the Kirghis Nor, and situated probably not far from the southern declivity of the Egtag Altai. This country has never been visited by Europeans, and is not further known.

We now pass to the description of the three mountain-chains which unite the Egtag Altai and the Baikalean Mountains. Their general direction is from west to east, nearly parallel to the Great Altai, and as they are placed at a considerable distance from one another, the valleys which intervene between them are extensive and run in the same direction as the mountains.

The valley between the Ulangom Oöla and the more northern chain, the Tangnu Oöla, is, according to Chinese authorities, traversed by a considerable river, the *Tess*, which has its source in the northern range, the Tangnu Oöla, receives many small rivers from the north and from the south, and falls, not very far from the place where the Tangnu Oöla joins the Egtag Altai, into a lake of considerable extent, called the *Upsa Nor*. This lake receives likewise, on its western side, other rivers descending from the Egtag Altai mountains. As we do not know exactly the distance between the Ulangom-Oöla and the Tangnu-Oöla, we are not able to form a conjecture as to the breadth of this valley, which in all other respects is entirely unknown to us, being situated within the limits of the Chinese empire.

The same observation may to a certain extent be applied to the great valley which lies to the north, between the Tangnu-Oöla and the mountains of Sayansk, and contains the sources of the Yenisei. But here the Chinese geography gives more minute particulars, and as the northern range (the Mountains of Sayansk) belong in great part to the Russian territories, they have been visited by a few Europeans.

The Tangnu-Oöla seems to extend chiefly to the south of the 50th parallel, and the mountains of Sayansk occupy the country between the 51st and 53rd parallel. In the valley between them, which extends from 420 to 450 miles from east to west, the river Yenisei has its sources. They are at the north-eastern corner of the valley, where the mountains of Sayansk, here called *Erghik Targak Taiga*, join the Baikalean mountains a little to the north-west of the lake of *Kossogol*. Two rivers here rise near one another, the *Hua-Kimu* and *Peï-Kimu*. The former has the more eastern source and runs along the mountains, which separate the valley from the lake Kossogol, towards the south, but afterwards declines by degrees to the south-west and west, and at last turns to the north and joins the other branch, the *Peï-Kimu*, whose course is chiefly to the south-west from its source up to its junction with the *Hua-Kimu*. Both rivers are increased by the waters descending from both the mountain-ranges, in which a great number of alpine lakes exist. After the junction of these principal branches the river, flowing from east to west, takes the name of *Ta-Kimu* (the great Kimu or Kem,) which is the only name of the Yenisei known in the Chinese empire. The Ta-Kimu receives likewise many tributaries from the south as well as from the north, till at last it unites with the *Kemitziki*, (or Little Kem, the Kemtshyk of the Russians,) a river running in a quite opposite direction from west to east, and having its sources in the Egtag Altai, at the point where this mountain joins the Ulangom-Oöla, not far from the sources of the Tshulyshman. The course of the Great Kem, from its source to its junction with the Little Kem, may be upwards of 260 miles, and that of the Little Kem upwards of 170 miles.

The river formed by their union is called by the Russians *Yenesei*, and runs north, traversing the mountains of Sayansk in all their breadth, and forming some considerable cataracts. It enters the lowlands of Siberia below the town of Krasnoyarsk, and before it reaches Yeniseïsk it receives on the right a large river, the *Upper Tunguska*. The rivers, which rise in the mountains of Sayansk, and fall into the Yenisei before its junction with the Upper Tunguska, run all of them parallel to the principal river, and are, therefore, not considerable, except the *Abakan*, which carries down the water of nearly all the rivers rising between the Tshulyshman and the Yenesei in the western chain of the mountains of Sayansk. The Upper Tunguska is formed by rivers rising farther to the east in the Baikalean range, to which, therefore, its description belongs. After its union with the Upper Tunguska, the Yenesei having made a great bend to the east, resumes its northern course and receives another great tributary, the *Lower Tunguska*, whose sources likewise belong to the Baikalean range. From this point the river continues its northern course till it reaches the Arctic Ocean, forming at its outlet a large gulph. The whole course of the Yenesei amounts to upwards of 1800 miles.

The mountains of Sayansk have not been examined with the same care as the Egtag Altai. About the middle of the last century some mines of silver and copper were discovered and worked; but they were soon abandoned, because the veins of silver were found to be irregular, and the copper, though much more abundant, did not promise great advantages. A few scientific travellers have visited the outskirts, and the smaller branches which advance into the lowlands; but none of its heights have been measured, and the opinion that only a few of its summits attain the point of perpetual congelation rests chiefly on the statement of the natives. It is likewise uncertain whether the summits of the ranges exhibit large level plains like the Egtag Altai, or such pointed peaks and narrow ridges as are observed in the Alps. The latter seems to be implied by the name of Erghik Targak Taiga, (the indented mountain,) which is given by the Chinese to nearly the whole range, extending from the Yenesei to the Baikal mountains.

The botany of the lower ranges has been examined by Pallas. The forests consist of birch, larch, fir of different kinds, and mountain-ash. Among the shrubs there are bilberry-bushes, and many kinds of wild roses, especially *Rhododendron chrysanthem*, which cover with its beautiful yellow flowers all the rocks of the mountain, and *Rhododendron dauricum*. Some of the plants belonging more properly to the Da-urian region were also found, especially some kinds of *Astragalus*.

Among the domestic animals, the rein-deer must be added to those of the Egtag Altai. The wild animals are the same; the red wolf and the sable are very numerous. According to the statement of the natives, the wild goat of the Alps is common in the higher parts. The rivers abound with fish, especially salmon and trout.

The Russians have lately introduced agriculture, which has made some progress; some of the natives, who formerly lived only on the produce of their herds, now begin to cultivate rye, barley, oats, &c.

The three mountain-chains, the Ulangom-Oöla, the Tangnu-Oöla, and the mountains of Sayansk, terminate to the east in an immense mountain-mass, which, from the sources of the Orkhon in the south, to those of the Upper Angara in the north, extends from the parallel of 48 to 59 north. In the middle of it is imbedded the *lake of Baikal*, the largest of all mountain-lakes, and hence the whole mountain-range is called by geographers the *Baikalean mountains*. The southern part of this mountain-mass about the sources of the Selenga, and the whole course of the Orkhon belongs to the Chinese empire, and is called by its inhabitants (the Kalkas Mongols) *Khangai* to the west of the Orkhon, and *Kentei* to the east of that river. The latter is properly only a part of the Khing-han-Oöla, a name applied by the Mongols to the high mountains that run to the south and to the north of the river *Amur*. The Russians call the range of mountains which separates this river from the lake of Baikal and its tributaries Yablonoi Khrebet, (Stone mountains,) or the *Mountains of Da-uria*.

On the south, the Baikalean mountains join the Great Desert, called the *Gobi* by the Mongols, and the *Shamo* (sea of sand) by the Chinese; or more properly, the mountains are only to be considered as the extreme northern edge of the desert. For though they offer a truly alpine aspect, and all the difficulties of mountain-passes to travellers who enter them on the north, no descent is made on the south side. No sooner has the traveller attained the highest part of the mountains than he discovers before him the high table-land, extending as far as the great wall on the north of China. Only on the east, between the tributaries of the Selenga and those of the Amur, they may be called a chain, for here they decline on both sides. Farther to the north they form one immense mass with the *Stanowoi Khrebet* and the Aldan Mountains; and on the north-western side, towards the river Yenesei, they gradually terminate in the lowlands of Siberia, not far from the junction of the Upper Tunguska with that river.

Even in those parts where the mountains do not join the table-land of the desert, the single ranges of the mountains present on their highest surface horizontal, or nearly horizontal plains, like those of Egtag Altai; on the plains, however, a few elevations rise which sometimes attain the line of eternal snow. This appearance is presented by the Yablonoi Khrebet, and the ranges that enclose the lake of Baikal on the east and north. The latter are higher, and many summits, though probably no plain, are always covered with snow, but without glaciers. These high table-lands do not descend towards the lake by a steep slope, but by terraces, so that the upper course of the rivers on the plains is slow and quiet, but when they arrive at the descent from one terrace to another, they run with great rapidity and frequently form cataracts, till they come to a lower level.

There are probably few countries, if any, on the globe of equal extent which can vie with this mountain-region in the number of rivers and lakes. It is stated that 177 rivers fall into the lake of Baikal, and on a new chart of this lake published by the Russian government, 160 of them are inserted. Besides the rivers falling into the lake, the sources of five large rivers are in this range. The Upper Tunguska rises on the south-west, the Lower Tunguska and Lena on the west, and the Witim, a large tributary to the Lena, on the east of the lake, and all of them at no great distance from it. The sources of the Amur are to the south of those of the Witim.

Three large rivers fall into the lake, the *Upper Angara* at the northern extremity, the *Bargusin* on the east, and the *Selenga* on the south: none of them has a course of less than 300 miles. The Upper Angara runs about 450 miles. Its sources lie to the east of its mouth, nearly at an equal distance from the sources of the Lena and those of the Witim. About seventy miles from its embouchure it enters a wide and low valley, only a little elevated above the level of the lake, and at a distance of about sixteen miles from it the river divides into three branches. The *Bargusin* runs from north-east to south-west, nearly parallel to the north-eastern shore of the lake, and rises not far from the sources of the Upper Angara and the Witim. In its upper course between high mountains it receives some considerable tributaries; in its lower course there are extensive levels on its banks. Towards its mouth it is again narrowed by rocks. Its course is upwards of 300 miles. The *Selenga* is the most important and largest of the tributaries of the lake, and receives the waters from a great extent of country. It rises, according to the Chinese Geography, on the northern range of the Khantai, south of the lake of *Kossogol*, and has six sources. After running about 100 miles, these branches unite and form one river, which running to the east for upwards of 120 miles, receives from the north-west the *Ekhe*, which rises in the lake of Kossogol, and joins the Selenga after a course of about 100 miles. Hence the Selenga runs to the north-east, and meets, after a course of 120 miles, the Orkhon running from the south, but the Selenga continues its course to the north-east after its junction with that river, and even after it has made its entry into the Russian empire, where it receives the *Tshikoi*, the *Khilok*, and the *Uda* from the east. About fifty miles from its mouth it enters a large valley widening gradually towards the lake, in which the river divides and forms a large delta. The whole course of the Selenga cannot be less than 700 miles, consequently longer than that of the Rhine, and at Selenginsk, 120 miles from its mouth, it was found by Bell twice as wide as the Thames (at London we suppose). The largest of its tributaries is the Orkhon, whose sources are far to the south, close to the northern edge of the Great Desert; with many windings, it runs to the north till it reaches the Selenga after a course of upwards of 350 miles. This river is greatly venerated by the Mongols, because on its banks at Karakorum was the seat of the dynasty of Tshingis-Khan. The Tshikoi, the Khilok, and the Uda run, on an average, 200 miles; the Khilok is the largest of these rivers; and the Tshikoi forms for a considerable space the boundary between the two empires.

The *lake of Baikal* extends between the parallels of 51° and 56°, and cuts the meridians of 99° and 106° obliquely. Its length is upwards of 350 miles, but its mean breadth only about thirty six; in some places the breadth may be forty-eight miles. Its surface covers more than 14,800 square miles, or half the extent of Scotland. [See BAIKAL.]

The water of this lake is carried off by one outlet, the *Lower Angara*, which issues from the lake on the western side, not very far from the southern extremity, and after a course of about forty-five miles, unites with the river *Irkut*, at the town of Irkutzk. Lower down it receives the waters of the *Uda*, a river descending from the mountains called Erghik Targak Taiga, and then its name is changed into that of the *Upper Tunguska*. At this junction it changes its course to the north, till again by a great bend it resumes its western course, nearly under the 60th parallel, and finally joins the Yenesei. Two or three miles from the lake the Lower Angara enters high and steep mountains, runs in a narrow channel, and forms considerable and long rapids for many miles, which render the navigation of this river very difficult.

The *Lower Tunguska*, another tributary of the Yenesei, rises to the north-west of the sources of the Lena, on the lower ridges of the mountain-mass, where they approach the low lands of Siberia. The first part of its course is north-east, but it gradually declines to north-north-east and north, and again to north-north-west and north-west, till it joins the Yenesei after running for a great distance due west. It does not receive any considerable river.

The Lena rises, like the lower Tunguska, in the mountains enclosing the lake of Baikal on its western side, at about twenty or twenty-four miles distance from the lake, nearly as far from the southern as from the northern extremity. It first directs its course to the north till it reaches the parallel of the sources of the Upper Tunguska, and afterwards to the north-east, in which direction it continues more than one-half of its course up to the town of *Yakutzk*, receiving two of its great tributaries, the Witim and the Olekma, of which the former rises in the Baikalean, and the latter in the Aldan Mountains. Below Yakutzk, it makes a great bend, by which its course is changed from north-east to north-west, and here it is joined by the greatest of its tributaries, the *Aldan*, which descends from the Aldan Mountains. Afterwards it turns to the N.N.W., and does not change this direction till it falls into the Northern Ocean. Its whole course may amount to about 2000 miles.

The Witim, a tributary of the Lena, rises at a distance of about thirty or forty miles from the eastern shore of the lake of Baikal, not far from the sources of the Upper Angara. It first runs with many bends to the north-east, nearly parallel to the mountain-chain that extends between it and the sea of Okhotzk; it then declines rapidly to the north-west, and in this direction it joins the Lena. The length of its whole course may be between 400 and 500 miles.

The third river system, which originates in the Baikalean mountains, is that of the AMUR. Nearly all the considerable rivers which form it rise in that part of the Baikalean mountains, which by the Russians is called *Yablonnoi Khrebet*, and by the Chinese Khing-han, and in which, though of a moderate mean height, the *Tshokondo*, an insulated peak, rises far above the region of eternal snow, to 7670 feet above the level of the sea.

The *geological* formation of this mountain-mass is much less known than that of the Egtag Altai. The lower ranges near Irkutzk are covered with a soft, fine, granulated sandstone, running from east to west, and dipping somewhat to the north. It rests on a conglomerate of granite, quartz, and pieces of felspar, united by a fine, granulated sandstone, and stratified like the layer above it. But not far from the lake of Baikal, it is changed into granite, which on the banks of the lake passes into gneiss. The same formation was observed round the lake, granite forming the principal base, but often passing into gneiss; and in some places chalk-hills rise between the mountains and the bank of the lake—this chalk is commonly of a soft, porous nature—and form capes which stretch far into the lake. On the eastern side of the lake, the granite and gneiss formation extends to the range of the Aldan mountains, and the direction of its masses is everywhere from east to west. In passing the Yablonnoi Khrebet, Pallas observed on the highest ridge a very fine-grained granite mixed with a small quantity of mica, which decreases towards the east. Gradually the granite passes into white stone, which is replaced by green stone, and the latter by gneiss. But the ranges through which the rivers forming the Amur pass are principally composed of granite and gneiss; the lower part, however, is covered by the slate-formation, and in some places by chalk; the two latter are even found alternating with one another. On the tops of some mountains jasper has been observed, and a few lower rocks consist entirely of this material.

Around the lake of Baikal, especially on its southern shore, there are unequivocal signs that this region once has been agitated by volcanic agency. In some places lava has been observed, and in the southern and eastern mountains hot and sulphurous springs are of rather frequent occurrence. Besides, this region is subject to strong earthquakes, and the peculiar motion which the waters of the lake experience is attributed to a similar cause. [See BAIKAL.]

The *metallic* wealth of the Baikal mountains is small, and almost limited to some indications of copper and iron ore, which latter does not seem to be very abundant, and is only worked in two or three places. In this mountain-region, a kind of mica is found which splits into very thin and transparent laminæ, and is used all over Siberia and in some parts of European Russia as window-glass. The best is met with on the banks of the small river Mana, a tributary to the Witim, and here alone, at present, it is worked to any considerable extent. In the mountains on the east of the lake are many salt lakes, some of which contain Epsom salts. In one place on the south-western mountains, not far from the lake, on the banks of a small stream, is found a quantity of *lapis lazuli* of every shade of colour.

The mineral riches of the mountains to the north of the rivers which form the Amur, or of the Da-urian mountains, are more important. The lower ridges consist probably of the flötz-formatiom of chalk, and contain abundance of litharge, which, however, is only worked for the silver and gold it contains. There are twenty-one mines, of which Captain Cochrane names the thirteen principal. From 1704 to 1809, only 17,020 puds of silver were extracted. As, however, in the first fifty-five years the whole produce amounted only to 1624 puds, we find for the remainder the annual produce of 235 puds, or 16,500 marcs. This produce, however, has been decreasing of late, not because the mines are exhausted, but because wood begins to be scarce in the neighbourhood of the mines. The lead is not used on account of the difficulty of transporting it over the mountains. According to Captain Cochrane, an iron mine has lately begun to be worked. In the mines on the mountains, the carnelian, onyx, amethyst, topaz, quartz-crystals, and other stones are frequently met with. Some lakes contain salt, and in one of them a great quantity is procured.

The slopes of the mountains about the lake of Baikal are covered with trees, most of them of the genus abies and pinus, of which the larch (*Pinus larix*) occupies the lower part of the slopes, and the *Pinus cembra*, whose fruits are gathered and eaten as a dainty, the higher part nearly up to the line of eternal snow. Some species of deciduous trees are found; the most common is the birch, (*Betula alba* and *nana*,) the poplar, and some species of willow. The trees of these regions do not much differ from those of the Egtag Altai. The shrubs and plants offer some peculiarities. Pallas was surprised at finding on the low delta of the river Selinga the plants of high mountains, and tries to account for this phenomenon by the shores of the lake being covered even in summer by cold and foggy air, and backed by high mountains.

In the mountains around the lake of Baikal wild animals are very numerous. The wolf is smaller and whiter than in Europe; the bear (*Ursus arctos*) is found in great numbers; both these animals produce an excellent fur. Besides these there are found, though in less numbers, foxes, lynxes, wild cats (*Felis onca*), and the glutton (*Ursus gulo*). The rivers contain otters and beavers; but the latter are not frequent, except in the Upper Angara. The musk-goat is still abundant; but its musk has much less strength than that of Thibet or India. Elks, stags, and red deer are frequent; but the rein-deer not. The wild rein-deer is of an ash-grey colour; but the domestic is always white, rarely spotted, never grey. Hares are most numerous, and besides the common, the mountain-hare (*Lepus alpinus*), and the hare of Da-uria (*Lepus dauricus*), are frequently found, especially on the eastern ranges of the mountains. Casan marmottes, alpine marmottes, and other animals of that genus, as also sables, abound. The skin of the latter, however, is not greatly valued, except it be from the animals killed on the Upper Angara. Of the squirrel, which is exceedingly numerous, there are different species found; some of them produce excellent fur, especially those of a dark-grey colour.

The birds and fish of this region belong almost exclusively to the lake of Baikal, and may be seen under the article BAIKAL. But we must notice the red salmon (*Salmo erythrinus*), a fish found only here in a small lake (the lake of Frölikha), not far from the Upper Angara. It is two feet long, and of the most beautiful red colour, varying in its shades.

The wild animals of Da-uria differ greatly from those of the Baikalean mountains. On the steppes bordering on the former, the dshiggitai (*Equus hemionus*) is met with, and in the narrow valleys the *argali*, or *mountain-goat*. Wolves and foxes abound, and likewise tiger-cats (*Manul*, Pall.). Among the hares is observed a very small species, called *Lepus pusillus*, covered with soft, yellowish hair. Red deer are abundant, and also the *dseren* (*Antilope gutturosa* . Among the birds are especially noticed by Pallas, Indian (*Ardea antigone*) and Numidian cranes (*Ardea virgo*), a large kind of bustards, the beard-vulture (*Vultur barbatus*), rock-pigeons, rock-thrushes (*Turdus saxatilis*), *Lanius phoenicurus* (Pall.), rock-nightingales, common cuckoos, rock-ravens, with red feet and beak (*Corvus graculus*). The lakes and rivers abound in fish, but not so much by far as those which fall into the lake of Baikal. Many fish not found to the east of the Uralean Mountains, reappear in Da-uria; but they are not generally of the same species as in Europe. No carp is found in Siberia; but in the Onon, Pallas met with two new species, *Cyprinus leptocephalus* and *Cyprinus labio*. The barbels are of less size than those of the Wolga, and likewise the shade fish (*Silurus asotus*). Neither of these are met with in Siberia. A kind of beluga is found in the rivers of this country. The common pikes have a gold-yellow colour and are spotted, so that Pallas in the beginning was induced to take them for a different species. The sturgeon is rare, as also *Salmo oxyrynchus*. Some smaller kinds of salmon, and other fish, are abundant. Cray fishes are not known to the east of the Ural; but two or more species are caught in the rivers of Da-uria. They, however, are of a smaller size than in Europe.

Lastly, we shall observe, that this country, like all those which are contiguous to deserts, suffers much from the locusts, which often destroy the scanty crops of the inhabitants. Serpents are not found on the table-lands, but they are frequent in the valleys; and some are said to be venomous. Pearl-oysters, of considerable size, are found in the river Onon, as also some other shells.

The *Stannowoi Khrebet*, or that range of mountains which, from the Yablonnoi Khrebet and the neighbourhood of Nertshinsk, runs to the Pacific Ocean and terminates on its shores opposite to the island of Taraikai, ought only to be considered as the southern extremity of the *Aldan Mountains*, which, with their lateral ridges, fill up the immense space between the sea of Okhotzk and the banks of the river Lena up to the town of Yakutzk. At this place, or rather at the mouth of the river Aldan, the Lena withdraws from the mountains, which afterwards fill up the whole region, extend over about the sources of the rivers *Yana*, *Indighirka*, and *Kolyma*, accompanying these rivers the greater part of their courses, so that only a flat coast of about 100 miles extends along the Arctic Sea: but, towards the north-eastern promontory of Asia, which terminates at the *Straits of Behring* with the Cape Tshukotshoi-Noss, the mountains draw nearer the Arctic Sea, and occupy, literally, the whole promontory and the sides of the river *Anadir* up to its embouchure.

The highest part of this mountain-range, and that which separates the waters, runs along the shores of the sea of Okhotzk, and at so small a distance, that all the waters descending to that sea from the eastern declivity of the mountains are mere rivulets. Only where the town of Okhotzk is situated, and to the east of that town, a few small rivers descend, among which the river *Okhota* is the largest, and even navigable for a short extent. Towards the west and north, the mountains descend, like all the ranges of the Altai, in terraces, and long-extended broad plains, overtopped by a few elevated summits of no great height. Few of them arrive at the line of eternal snow. A modern traveller has found a summit rising to upwards of 5000 feet. The valleys run here likewise mostly in the direction of the mountain-chain, from south-west to north-east, and are joined together by a few transverse valleys, which carry the waters to the west. But this observation holds only good for the southern portion of the range up to the sources of the Indighirka, for from hence to the Cape Tshukotshoi-Noss the mountains in all their length seem to be cut by long transverse valleys.

Two large tributary rivers of the Lena rise in this chain, the *Olekma* and the *Aldan;* the former of which, rising to the north of Nertshinsk nearly in the meridian of that town, runs upwards of 300 miles through a desolate country, nearly due north, till it reaches the main stream. The *Aldan* is a large river, whose course is upwards of 900 miles from its source, under about the 55th parallel, to its junction with the Lena, under the 63d. It receives nearly all the waters issuing from the principal chain between the tributaries of the Amur, and the sources of the Indighirka. From its source it runs in a north-west direction, cutting eight degrees of latitude and nine of longitude, and in this tract it receives, from the right, the waters brought down by the *Maya*, a river that runs upward of 400 miles, and joins, not far from its mouth, the *Yudoma*, which is not inferior in size and length. The inferior course of the Aldan is in a transverse valley, nearly due west, for about 250 miles, and here it receives still a considerable tributary from the left, the *Anga*, whose course is from 400 to 500 miles parallel to that of the Aldan. The Aldan is of great importance for the communication between Yakutzk and Okhotzk; the merchandise ascends the Altan, the Maya, and the Yudoma, and is, from the latter, transported over a ridge of comparatively small extent to the Okhota, and on that river to Okhotzk.

The Yana, the Indighirka, and the Kolyma run nearly parallel to one another to the north, with a declination to the east, which is greatest in the last, and smallest in the first. The Yana may have a course of about 400, the Indighirka of between 600 and 700, and the Kolyma of about 900 miles.

The *Anadir*, which falls into the sea of Kamtshatka, the most northern portion of the Pacific Ocean, traverses a very mountainous country, and makes so many bends to every point of the compass that it is difficult to indicate its course farther than by stating, that in the upper part of its course its general direction is from north to south, and in the lower from west to east. Its whole length exceeds 600 miles.

The distribution of the plants and animals on this extensive range, and their gradual disappearance towards the north, is almost entirely unknown; at least, not so far known as to enable us to form a proper enumeration. In no part of the world are sables so numerous as here; but they are not of the first quality, and much inferior to those of the Upper Angara. The wild rein-deer, which forms here the principal object of the chase, has a spotted skin.

We cannot leave this region without observing, that in the low country, which extends between the northern extremity of this chain and the Arctic Ocean from the west of the mouth of the Lena to the east of that of the Kolyma, innumerable heaps of fossil bones of elephants, rhinoceroses, buffaloes, and other animals of the torrid zone, and also antediluvian remains are imbedded in a soil which apparently is alluvial. (See SIBERIA.)

The chain of mountains which traverses the peninsula of Kamtshatka may be considered as an appendage to the Aldan mountains, but as its description is closely united with that of this peninsula itself, it will be found under the article KAMTSHATKA.

The Altai mountains are situated between two regions, which, by their nature, are unfit for agricultural purposes, except in a few isolated places, and which, therefore, from time immemorial have been inhabited by wandering nations, who draw their subsistence from herds. The mountains, however, contain many valleys well adapted for agriculture, and there exist some indications that these valleys have once been cultivated, very probably by the same nation that has worked the mines all over the range to a great extent. This nation, which is known under the name of the *Tshudes*, is not named in history, and has entirely disappeared, though the immense number of antient tombs found everywhere, but especially on the mountains of Sayansk, evidently prove that this region was once better peopled. The nation probably was destroyed by its Nomadic neighbours, and with it agriculture disappeared from the valleys. But since the two most extensive empires of the world, the Chinese and the Russian, have taken possession of these ranges, and peace has been established in a region which, doubtless, for many centuries had not enjoyed it, agriculture has again been introduced, and as it would seem with better success by the Chinese than by their more northern neighbours. (See Baron Humboldt's *Fragmens Asiatiques;* Klaproth's *Tableau Historique de l'Asie;* the *Travels* of Timkowsky, Pallas, and Ledebour; and Ritter's *Erdkunde von Asien.* Of maps, only those found in the works of Baron Humboldt, Julius von Klaproth, and in the *Travels* of Ledebour, have been used here.)

ALTAMURA, a considerable town of the kingdom of Naples, in the province of Bari, near the borders of Basilicata. Its population is reckoned at 16,000 (in 1789 it was 15,890). It was a baronial estate of the Farnese family, after the extinction of which it devolved on Charles Bourbon, Infante of Spain, and afterwards King of Naples. It is built on a hill at the foot of the Apennines, and has an old castle. It has a fine cathedral, founded by Frederic II. and ornamented with pictures. It lies on the high road from Puglia into Basilicata. In 1799 it was a stronghold of the republican party in that district, and being summoned by Cardinal Ruffo, who was advancing by that road at the head of his Calabrians, refused to open its gates, and after an obstinate defence it was taken by storm, when a dreadful massacre of the inhabitants took place, attended by rape and other horrors. Since that time, however, it has recovered, and is now a place of considerable trade in the agricultural produce of the country; good wheat is grown in the neighbourhood. Its fairs are well attended. It is stated by some authorities that many of the inhabitants are Greeks. It is in about 40° 47′ N. lat., and about 30 miles S.W. of Bari.

ALTAR, an erection to offer sacrifice upon. The first altar mentioned is that set up by Noah, to offer sacrifice when he quitted the ark; and throughout the history of the Jewish patriarchs altars are continually said to have been erected by them, in different places, as circumstances rendered it expedient. These seem to have been built of earth, or unhewn stone, like the altars which God commanded Moses to raise: *Exod.* xx. 24, 25. But when the Jewish law was given, the right of raising altars and offering sacrifice was no longer left common to all men; but one altar of burnt-offering, at which alone victims were slain, was made for the whole nation, and the priests, as ministers for the nation, offered sacrifice upon it for all. This in the first instance was constructed of wood, covered with brass, and always followed the ark, while the ark was migratory; but when Solomon built the temple, he placed a stone altar, with a brazen hearth, in the court before it. The Jews had two other altars, one solely appropriated to burning incense, called the altar of incense; the other called the altar of shew-bread, because loaves were placed upon it, and changed every Sabbath. Both of these stood in the interior of the temple.

We constantly meet in the Bible with the expression of the 'horns of the altar.' Some suppose that these were really the horns of animals; others that they were merely projections at the corners. One use of is them obvious: victims might be conveniently bound to them. *Psalm* cxviii. 27. But horns were an emblem of power and authority throughout the east; and probably they were also meant to indicate the greatness of him to whom the altar was sacred. The altars of the Greeks and Romans had sometimes horns also, to which animals were fastened, and to which those who fled thither for protection used to cling. It was an act of impiety to force such persons away. This belief in the sanctity of places was adopted by the Roman Catholic church, which, in the season of its temporal power, largely bestowed the privilege of sanctuary upon favourite churches and convents. [See ASYLUM.]

A sort of natural religion seems to have pointed out the tops of hills, and groves, as the fittest spots for altars. The pagan nations which surrounded the Jews were especially addicted to worshipping in high places; and it was hardly possible to prevent the Jews themselves from falling into this habit. 'They also built them high places, and images, and groves, on every high hill, and under every green tree.' 1 *Kings* xiv. 23. Passages of the same import occur continually in the Jewish Chronicles. The northern nations of ancient Europe worshipped in the thickest shade of their forests. The ancient Persians, as Herodotus tells us (I. 131.) made no temples, nor statues, nor altars, but worshipped the deity on the tops of the mountains.

The altars of the Greeks were of three sorts: those dedicated to the heavenly gods, (*βωμὸς*,) were often structures of considerable height; those of demi-gods and heroes were low and near the ground (*ἐσχάρα*); and those of the infernal deities (if such may be called altars) were trenches sunk in the ground (*βόθρος*, *λάκκος*). They may again be divided into three classes, those for burnt-offerings (*ἔμπυρος*): those on which no fire was used, which were (*ἄπυροι*), meant for offerings of fruit, meal-cakes, &c.; and those on which fire might be used to consume vegetable productions, but no blood was spilled (*ἀναίμακτοι*), the altar: when dedicated to either of the latter classes, it was often nothing more than a raised hearth or step. Each temple usually had two altars, one in the open air before it, for burnt-offerings; another before the statue of the god to whom the building was sacred. Altars were often erected where there was no temple. The Greek altars were usually square, sometimes circular, or triangular. They were often made of marble, and elegantly sculptured.

The Roman altars and rites of worship much resemble the Greek. We must distinguish between *altare* and *ara*. The former, as is indicated by the syllable *alt*, signifying high, was an elevated structure, used only for burnt-offerings, and dedicated to none but the heavenly gods: the latter might belong either to the heavenly, or infernal gods, or to heroes. The Romans, however, like the Greeks, dug trenches (*scrobes*), into which they poured libations to the infernal gods. *Ara* seems to be the general term, and is used by Virgil as including *altare*;

En quatuor aras,
Ecce duo tibi Daphni, duoque altaria Phœbo. *Ecl*, v. 65.

From *altare* comes the English word altar, which by the Roman Catholic church is used in its proper sense, to denote an erection on which sacrifice is offered, it being their doctrine that the mass is a sacrifice. Applied to the communion-table of an English Protestant church, the word is used metaphorically, or rather, is misplaced; for the English church teaches the sacrament of the Lord's Supper to be no sacrifice, but merely a symbol.

ALTDORF, or ALTORF, (Old Village,) is the capital of the Canton of Uri in Switzerland. It stands at a short distance from the lake of the Four Cantons, in a valley surrounded by lofty mountains, and on the right bank of the Reuss, which flows into the lake. It is about twenty miles S.E. of Luzern, and in 46° 52′ N. lat., 8° 45′ E. long.: the elevation of the town above the lake is given differently by different authorities: the lake itself is about 1400 feet above the level of the sea. Altorf being at the foot of a lofty mountain would be in danger of suffering from avalanches, but for the pine forests on the slopes, which serve as a rampart against the falling masses. It was burnt in 1799, and rebuilt in better style. The town-house, a handsome parish church, and a school, are among the chief buildings: the population is about 1700. Altorf stands at the Swiss termination of the pass over Mount St. Gothard, and supplies horses and carriages for crossing the mountains to Bellinzona in Italy. It is also a kind of entrepôt for goods passing into or from Italy by the St. Gothard pass. An old tower at Altorf is said to mark the spot from which Tell shot the apple from his son's head; and a fountain now occupies the place of the linden tree under which the boy stood.

ALTENBURG, the capital of the duchy of Saxe-Altenburg, is situated about two miles west of the left bank of the Pleisse, a tributary to the Elster, 50° 50′ N. lat. 12° 27′ E. long. The town stands on uneven ground, and consists of a main part and several suburbs: it is in parts well built. It contains eight churches, a gymnasium founded in 1703, with a considerable library, an hospital and house of correction; also a foundation for noble ladies, a society of naturalists, a theatre, &c. The chief branches of industry are manufactures of linen, ribands, gloves, vinegar, starch, coaches, &c. There is also a considerable trade in cattle and corn. The population in 1822 was 10,604; in 1832, 12,629.

The castle of Altenburg stands on a rock, and is known in German history as the place for which the young princes Ernest and Albert, the founders of the two chief lines of the Saxon house, were carried off by Kunz von Kauffungen, A.D. 1455. Altenburg was once an imperial city, and the capital of a district called Pleissen. After 1172 we find it mentioned as a place where the emperors sometimes resided and held diets. (See SAXE-ALTENBURG, for an account of the duchy and its political changes.)

ALTERATIVES, a word signifying 'things that produce a change.' Under this head are comprehended those medicines which do not produce any immediate or very perceptible effect, but which gradually bring the body from a diseased to a more healthy state. They seem to act in removing unhealthy conditions of the system, much in the same way that a drop of water hollows a stone, not by its violence, but by frequently falling. They are generally given in small and frequent doses, and, even when given in large doses, they are often repeated. The former mode of administering them is employed when they are powerful medicines, the latter when less active. Out of almost every class of medicines some one may be used as an alterative—its claim to be so regarded depending less upon its natural powers, than upon the manner in which these are modified, so as to effect a particular purpose. Thus by diminishing the dose, or combining them with other medicines, some of the most powerful drugs we possess are capable of being employed as alteratives, and made to produce effects exactly opposite to what they do when given alone or in large doses. Ten grains of ipecacuanha, for example, taken with some fluid into the stomach, will speedily cause a feeling of sickness, followed by vomiting—three or four grains will cause a feeling of sickness and loss of appetite, though not actual vomiting—while one-quarter or one-half a grain taken about an hour before each meal for several days in succession, will be found greatly to increase the appetite, and improve the digestion. Yet even ten grains of ipecacuan, if taken along with two of opium, will not produce any obvious effect on the stomach, but, if the patient be kept warm in bed, will cause a profuse flow of perspiration.

Many of the forms or preparations of mercury, even the most active and poisonous, when given in very small doses, neither prove purgative nor destructive to life, but, on the contrary, often produce signal benefit, relieving the patient from many complaints which rendered his days miserable, or even threatened to shorten them. Nor is the most dreaded of the mineral poisons—arsenic itself—incapable of contributing to the restoration of health, since we see it now make the shivering ague cease, and at another time cause the agonizing headache to depart.

Others which are less active may be given in very large doses, as sarsaparilla, and similar articles.

The variety of agents which may be used as alteratives must convince us that they cannot all act in the same way, and that their beneficial effects cannot be attributed to the same cause. Most of them appear to act upon the secretions and excretions—either by increasing their quantity or altering their quality. In many parts of the body, but particularly along the course of the alimentary canal, are situated glands, the duty of which is to elaborate from the blood certain fluids containing salts and other principles, which are primarily useful in keeping moist the surfaces over which they flow, and often secondarily useful in effecting changes in the matters with which they come in contact, as the saliva with the food, as soon as it is received into the mouth, and the bile with the chyle, upon its passage out of the stomach. These, then, are secretions. The kidneys and skin are organs by which fluids are separated from the blood, serving as vehicles for the removal from the system of salts and other principles no longer useful, the retention and accumulation of which would soon prove hurtful, and ultimately fatal. These are termed excretions:—that of the kidneys being of no primary or secondary use, while that of the skin keeps this covering moist and pliant,—states necessary for its answering the objects of its existence.

The preservation of a due proportion in the quality and quantity of these secretions and excretions is essential to the maintenance of that equilibrium, that fair and equal, or harmonizing play of all the organs of the body, when, feeling no weight or oppression in any part, a man readily says he *is well*. The disturbance of this balance gives rise to various degrees of uneasiness and ill-health: states to which the French apply the expressive term—*malaise*.

The functions of secretion and excretion being rather vital than chemical processes, they are greatly dependant upon the state of the nervous system. This, again, is only perfect when the blood is of a proper quality; and this last is beholden for its excellence to the thorough performance of digestion, for which a due supply of nervous energy is required.

As all these functions act and react upon each other, it matters but little which of them is the first to fail in contributing its part to the general welfare, as all in time suffer; but the functions of secretion and excretion, perhaps, soonest show a falling off, and soonest attract the attention of the patient. He awakes with a dry tongue, and observes that the secretion from the kidneys is less in quantity and more highly coloured than natural, or excessive in quantity and pale, or he perceives that the skin is dry and harsh, or bloated.

To remedy these states alteratives are often employed. Small doses of some mercurial, alone, at night, or with rhubarb and soda during the day, or small quantities of ipecacuanha, will often relieve the dryness of the mouth. A little common salt taken immediately on waking will also remove it. With this view a little bacon has often been recommended at breakfast—the benefit being due to the salt, not the bacon.

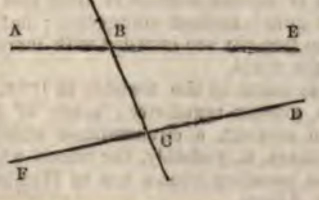
The removal of the depraved and unhealthy secretions from the intestinal canal, where they are apt to linger, causing uneasiness to the patient, and by the unpleasantness of his breath rendering his presence disagreeable to others, is best effected by a course of gentle purgatives. The frequent repetition of too powerful purgatives is to be reprobated, as often occasioning disease of the inner coats of the alimentary canal. After these, some strengthening medicine, as bark or iron, will generally be useful, especially if the nervous system be out of order, owing to much mental exertion, or protracted night-watching. At this stage of the treatment, exercise and travelling, change of scene and pursuit, are of much service; or a visit to some watering-place; for the mineral springs, having the saline ingredients very minutely divided, may be considered as nature's alteratives.

Where the skin is much affected, exercise of a regulated kind, such as that practised by trainers, may prove useful, as the diet is at the same time strictly attended to. Indeed, a partial or complete change of diet is often the most effectual alterative we can employ.

But neither medicines nor a strict plan of diet should be begun or continued without the advice of a competent judge. It is in such cases that persons are most apt to undertake the cure of their own complaints, and, either by using inefficient means allow them to get rooted in the system—or, by employing the *nostrums* and secret, but often dangerous, combinations of *quacks*, become a prey in their purses and persons to ignorance and fraud.

The explanation of the functions of the system, and the action of remedies, already given and hereafter to be given in this work, are by no means intended to enable the patient to dispense with the assistance of his medical attendant, but to enable him to receive the full benefit of that assistance, by enabling him to understand something of the principles on which his treatment is conducted, and thereby to teach him how he may co-operate with his physician in rendering it effectual.

ALTE'RNATE. In geometry, angles are said to be alternate which are made by two lines with a third, on opposite sides of it, as ABC and BCD, or EBC and BCF. If two lines be parallel, the alternate angles made by a third line with them are equal.



In algebra, those terms of a proportion are said to be alternate which are separated from one another by another term; thus, in the proportion

2 is to 4 as 8 is to 16,

2 and 8 are alternate terms, as also 4 and 16. If alternate terms be rendered consecutive, and consecutive terms alternate, the proportion still continues; thus,

2 is to 8 as 4 is to 16.

This proposition is the sixteenth of the fifth book of Euclid, and is referred to by the Latin word *alternando*, or by the English words 'by alternation,' or 'alternately.'

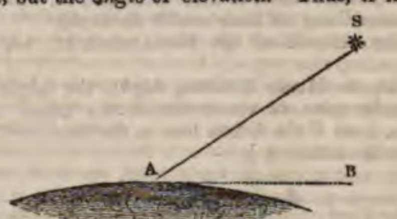
ALTHÆA OFFICINA'LIS, or MARSH-MALLOW, is a plant the use of whose mucilaginous roots and leaves in all cases in which emollient or demulcent substances are required, is of great antiquity. It is a common European plant, belonging to the natural order *Malvaceæ*, and is often found in marshes, especially near the sea, in great abundance. It is a perennial, with a carrot-shaped white fleshy root, as thick as the thumb, and a foot or more long. The stems are two or three feet high, covered all over with a soft down, which also is found on the leaves, to which it gives a hoary aspect. The leaves are soft, stalked, often a little heart-shaped, divided into three or five shallow serrated lobes. The flowers are of a pale rose colour, and appear in very short clusters from the bosom of the leaves; their calyx is five-toothed, and surrounded with eight or ten, or even more bracteæ. The corolla and other parts are like those of the common mallow.

[Marsh-Mallow.]

Althæa Rosea, the *Hollyhock*, is another species, found wild in China, and now extremely common in our gardens. Linnæus considered it a distinct genus, which he called *Alcea*.

ALTI'SSIMO, in Music (Italian, the superlative of *alto*, high). The scale in *altissimo* commences with F, the octave above the fifth line in the treble.

ALTITUDE, from the Latin *altus*, *high*, may be rendered by the English word *height*. This being the case, we should have referred it to the English word, if the term were not particularly reserved in astronomy to signify, not the *length*, but the *angle* of elevation. Thus, if A be the position of a spectator on the earth, and A B the line on the horizon, which is drawn towards the point directly under the star S, the angle B A S is the altitude of the star. For other less common applications of the term, see HEIGHTS.



The altitude of the pole is the geographical latitude of the place of observation, and remains the same throughout the twenty-four hours: the altitudes of the stars and sun change with the diurnal motion; being nothing when they rise and set, and greatest when they are on the meridian.

The altitude of a star is directly observed at sea with the SEXTANT; and the uses which are made of such observations may be seen in the following mathematical propositions, into the proofs of which we cannot enter here.

1. When the latitude of the place is known, the time of day may be found from one observation of the altitude of the sun or a star; or conversely, if the time of day be known, the latitude may be found from the observation.

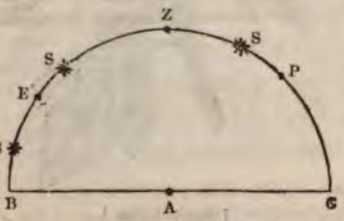
2. When neither the time nor the latitude is known, both may be found by observing any two altitudes of the sun or a

star, and noting the time which elapses between the observations; but it is most convenient to observe one altitude first, before a star comes to the meridian, and then wait for the time when the same star comes to the same altitude on the other side of the meridian. Or if the latitude be very nearly known, a more accurate approximation may be simply made by the above method.

3. If the star be one of those which never sets, the latitude of the place is the half sum of its greatest and least altitudes.

In all that precedes, it is supposed that the star is *known*,—that is, that its right ascension and declination are known; and certain corrections must be applied to the observed altitude, for which see REFRACTION, PARALLAX, DIP.

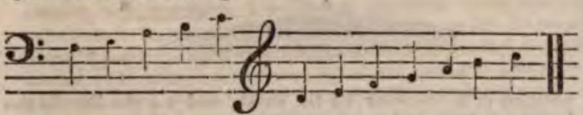
In fixed observatories on land, the altitude of stars, or rather their zenith distances, which are what the altitudes want of ninety degrees, are observed with the mural or the transit circle (see CIRCLE, MURAL; CIRCLE, TRANSIT); but only when the stars are on the meridian. Let A be the place of the observer, C and B the north and south points of his horizon, P the north pole, Z the zenith, C P Z B the meridian, arcs of which may be made to represent angles at A, and S the star on the meridian, whose altitude, B S, or C S, according as it is south or north of the zenith, or its *complement*, the zenith distance, Z S, has been observed. Then, E being a point in the equator, and P E being equal to Z C, both being ninety degrees, take away the common part Z P, and E Z is equal to P C, the latitude of the place. And E S, or the star's declination, is E Z diminished by Z S, if the star passes the meridian above E, or Z S diminished by E Z, if the star passes below E. If the star passes between the zenith and the pole, the declination E S is the sum of E Z and Z S. That is, the declination of a star is the difference between its observed zenith distance and the latitude of the place, if the star passes south of the zenith, or the sum of the same quantities, if it passes between the zenith and the pole. In the first case the declination is *north*, if the latitude be greater than the zenith distance; *south*, if the zenith distance be greater than the latitude: in the second case, it is always north.



In this way, with a number of minute precautions for the sake of accuracy, catalogues of the declinations of stars are formed, by observation of their altitudes, or, which amounts to the same thing, of their zenith distances.

For the altitude of the NONAGESIMAL, see NONAGESIMAL.

ALTO, in Music (Italian, *high*), the highest natural adult male voice, or countertenor, the usual compass of which is, from F the fourth line in the base, to C the third space on the treble, *e. g.*—



Alto, Italian, the instrument called in England the Tenor, and by the Italians, the VIOLA.

ALTO CLEF, in Music, a name of the C clef, when placed on the third line; more commonly, in England, called the countertenor clef. See CLEF.

ALTO-RILIEVO (high relief), a term which designates that kind of sculpture which is executed on a flat surface, but projects considerably above the ground or plane. The degree of projection given to alto-rilievo depends on the will of the sculptor; more than three-fourths of the figure are frequently shown, and figures in basso-rilievo (low relief) are sometimes added, to express gradations of distance. The attempt to give a picturesque air to sculpture has usually a barbarous effect, but the temptation afforded to that species of practice by alto-rilievo has seduced many artists, and those of no mean powers, into the experiment. The largest performance ever executed in alto-rilievo is the stupendous work by Algardi, in St. Peter's at Rome, representing the Repulse of Attila by St. Peter and St. Paul. The gigantic figures in front of this composition project nearly in the full rotundity of nature, and the middle and distant groups subside through all the degrees of projection into the lowest basso-rilievo. However erroneous the style, it is impossible to refuse admiration to the powers displayed in this work. The alto-rilievos by Donatelli at Florence are among the most perfect examples of this art. There are specimens by various practitioners in Westminster Abbey, which exhibit all the eccentricities of bad taste. The most legitimate use of alto-rilievo is where it is introduced in alternate or occasional compartments to give relief by the boldness of its projections to the uniformity of a large surface. Such are the Metopes among the Elgin Marbles, which, alternately with the triglyphs, ornamented the frieze of the entablature which surmounted the exterior colonnade of the Parthenon. Fifteen of these original Metopes, with one cast, are in the British Museum; they are of unequal execution, but several of them may be referred to as the finest examples extant of alto-rilievo. [See *Elgin Marbles*, published by the Society for the Diffusion of Knowledge.]

ALTON, a market town in Hampshire, on the road to Winchester, forty-seven miles south-west of London, near the source of the river Wey. It is a well-built place, with three principal streets, partially paved by subscription and lighted. Some bombazeens and serges were made, but this manufacture seems to have decayed, nor is the town at present noted for any particular branch of industry. There are hop plantations in this neighbourhood; and two breweries in the town. The living is a vicarage in the gift of the Bishop of Winchester. The church is neat, and there are two or three meeting-houses for the Dissenters. Alton has a national school.

The market is on Saturday; and there are two fairs in the year. The population in 1831, was 2742.

During the civil wars, the royalist troops, under Lord Hopton, were surprised at Alton by the Parliamentarians under Sir William Waller.

A'LTONA, or ALTENA, a considerable city belonging to the Crown of Denmark, situated in the Lordship of Pinneberg, which is an appendage to the duchy of Holstein. Next to Copenhagen, Altona is the most important town in the Danish dominions, although at the time when Pinneberg was united with Denmark, in 1640, it was only an inconsiderable village. In 1664, it obtained the rights and privileges of a city.

Altona stands on the north bank of the Elbe, in 53° 34′ N. lat., and 9° 55′ E. long., about seventy-five miles from the mouth of the river, and about two miles below, and to the west of Hamburg; the suburbs of which city are in fact only separated from the Danish city by a wall.

The manufactures employ about 2200 hands. They consist of silk, woollen, and cotton goods, tobacco, soap, candles, and leathern articles, together with glass-houses, distilleries, breweries, and sugar-refineries, besides some establishments of minor importance. Ship-building also has long been carried on, and several vessels belonging to the port are employed annually in the herring and whale fisheries, and in trading to the Mediterranean.

The trade of the port bears only a small proportion to that carried on in the neighbouring City of Hamburg, which presents the constant appearance of commercial activity, while the streets of Altona are comparatively deserted. The marine of Altona consists of little else than a line of gun-boats to guard against smuggling; but the docks and canals of the free city are crowded with merchantmen from all parts of the world.

Altona was burnt by the Swedes in 1713, but has been rebuilt with greater regularity; many of the houses are spacious and elegant, a circumstance which, added to its greater quietness, is, probably, the reason why several merchants whose counting-houses are in Hamburg have their residences in Altona.

The town contains a public school or college, founded by Christian VII., a library, and an orphan house. It has also six churches and two synagogues for German and Portuguese Jews, who are very numerous. The native inhabitants are principally Lutherans; the remainder Calvinists, with a few Roman Catholics. The population in 1831 was 26,500. (Semple's *Observations on a Journey from Hamburg to Berlin.* Cannabich, *Diction. Géograph.*)

ALTRINGHAM, or ALTRINCHAM, a small town in the parish of Bowdon and county of Chester, near the Duke of Bridgewater's canal from Manchester to Runcorn: it is about 8 miles south-west of Manchester, and nearly 180 north-west from London. The neighbourhood supplies Manchester with fruit and vegetables; and the salubrity of the air makes it a place of some resort for invalids. It is a neat and clean town, with a population in 1831 of 2708. The chief manufactures are of cotton and worsted. There is a corporation, but the mayor has no jurisdiction. Besides a chapel for the members of the Established Church, there are two Methodist and one Unitarian meeting-house. The market is on Tuesday, and there are three fairs in the year.

ALUM, an earthy salt, which occurs in a native state only in small quantities, but it has been long artificially made, and extensively employed in various chemical manufactures. Its basis is sulphate of alumina, combined usually with sulphate of potash, but sometimes with sulphate of soda or sulphate of ammonia: when the first alkaline salt enters into its composition, the product is *common* or *potash alum*, the second forms *soda alum*, and the third *ammonia alum*. Alum appears to have been known from the earliest ages; it occurs in a native state in Carinthia, and also at Miseno, and other places in Italy. *Alumen*, with its mode of preparation, uses, &c., is described by *Pliny* (xxxv. 15); and the best is said to have been obtained from Egypt (see *Herod.* ii. 180, *στυπτηρίη*) and the island of Melos: it was made, however, in several other places. In the middle ages, alum was manufactured in Rochha, the Turkish name of the government which comprehends Edessa (Niebuhr, *Reisebeschreibung*, ii. p. 409), whence comes the name Roch alum, still in use. It was also made near Smyrna and Constantinople. About the middle of the fifteenth century alum was manufactured at La Tolfa, and other places in Italy, and Pope Pius II. prohibited the use of oriental alum. The alum-stone of La Tolfa contains all the ingredients of alum mixed with silica: to procure alum from the stone, it is broken into pieces, roasted, exposed to air and moisture, and the soluble parts being dissolved in water, crystals of alum are obtained as the solution cools.

In the reign of Elizabeth the alum-works of Whitby were established; which, with those since formed near Glasgow, supply the market with a large quantity of alum. The alum is procured from alum-slate, the stratum of which is nearly thirty miles in length: this alum-slate has not been accurately analyzed, but it does not appear to contain any potash salt, and this is therefore added. The method of manufacturing, is to mix the broken alum-slate with fuel, and set it on fire; when the combustion is over, the residual matter, consisting of earth, oxide of iron, and sulphate of alumina, is lixiviated with water; a solution of the earthy salt being obtained, potash salts are added to it, and crystals of alum are formed. It requires about 130 tons of calcined alum-slate to produce one ton of alum. Near Glasgow alum is manufactured from *slaty clay;* which is obtained from old coal pits; the slate contains also iron pyrites, and both its constituents combining with oxygen, sulphate of iron is formed, with excess of sulphuric acid, which acting upon and combining with the clay or alumina of the slate, forms a double sulphate of iron and alumina, which crystallizes in small filaments, of a greenish-white colour.

When the slate containing this double salt is put into water, it is dissolved; by evaporation, crystals of sulphate of iron are obtained, and to the solution, which is principally sulphate of alumina, potash salts are added, and crystals of alum are formed; these are purified by redissolving them in water and crystallization. By exposing to air and moisture the slate which remains after the solution of the sulphate of iron and alumina, a further portion of the pyrites is acted upon, and more sulphate of iron and alumina are obtained, which are dissolved, as before, in water.

Alum is also sometimes prepared by directly combining sulphuric acid and alumina, with the addition of potash salts; in general, however, this method is much less economical than those already detailed. By whatever process alum is prepared, its properties are the following: it is colourless, inodorous, has an astringent taste, and crystallizes generally in regular octahedrons; but by the addition of alumina, and particular management, it may be made to crystallize in cubes. It is brittle, and easily reduced to powder; its specific gravity is about 1·731; water, at 60° Fahrenheit, dissolves about one-eighteenth of its weight of alum, and boiling water about three-fourths of its weight. The solution reddens vegetable blue colours strongly; when exposed to dry air, alum effloresces slightly on the surface, but it remains long without undergoing any change internally. When moderately heated, alum dissolves in its water of crystallization; if more strongly heated, the water is evaporated, and when exposed to a very high temperature, sulphuric acid is expelled, and there remains a mixture of alumina and sulphate of potash.

Alum has been frequently analyzed, and the later results of chemists differ but little. According to Dr. Thomson it consists of

Four atoms of sulphuric acid .	40 × 4	= 160	or 32·85
Three atoms of alumina .	18 × 3	= 54	„ 11·08
One atom of potash . . .		= 48	„ 9·85
Twenty-five atoms of water .	9 × 25	= 225	„ 46·22
		487	100·00

The same chemist considers its atomic constitution to be

Three atoms of sulphate of alumina	58 × 3	= 174	or 35·73
One atom of sulphate of potash		= 88	„ 18·07
Twenty-five atoms of water .	9 × 25	= 225	„ 46·20
Weight of its atom .		= 487	100·00

The analysis of Berzelius agrees very closely with that of Dr. Thomson; the greatest difference is in the proportion of sulphuric acid, which the former states to be 34·23 per cent., being 1·38 greater than the quantity found by Dr. Thomson.

Soda alum is not met with in commerce. It may be prepared by adding sulphate of soda to a solution of sulphate of alumina; by evaporation crystals are obtained, which, when pure, have the following properties: their taste is astringent, and their form the octahedron, like that of potash alum; they are more brittle and more soluble in water than the crystals of common alum; their specific gravity is about 1·6. When soda alum is heated nearly to redness, it loses its water; and when more strongly heated, sulphuric acid is expelled. Its other properties are similar to those of common alum. It appears to consist of

Three atoms of sulphate of alumina	58 × 3	= 174	or 36·94
One atom of sulphate of soda		= 72	„ 15·28
Twenty-five atoms of water .	9 × 25	= 225	„ 47·78
Weight of its atom .		= 471	100·00

According to Dr. Thomson, soda alum occurs in a native state at St. Juan, near the city of Mendoza in South America. It is found in small nodules, and differs from the crystallized salt in containing only twenty atoms of water.

Ammonia Alum may be prepared by adding sulphate of ammonia to sulphate of alumina in solution. By evaporation octahedral crystals are obtained, similar in appearance and in many properties to those of the preceding alums. It is more soluble in water than potash alum, but less so than soda alum; in taste, and in action upon vegetable blue colours, it resembles them.

When moderately heated it swells, fuses, and loses its water of crystallization; and if the heat be much increased, the whole both of the sulphate of ammonia and sulphuric acid is expelled, and pure alumina remains. This alum is not prepared for use in England, but it is said to be manufactured in France. It is readily distinguished from the other alums, by the evolution of ammonia, which takes place on the addition of potash or soda in sufficient quantity.

According to Dr. Thomson, ammonia alum is composed of

Three atoms of sulphate of alumina	58 × 3	= 174	or 38·15
One atom of sulphate of ammonia		= 57	„ 12·50
Twenty-five atoms of water .	9 × 25	= 225	„ 49·35
Weight of its atom .		= 456	100·00

We have already mentioned that alum is decomposed by heat; and the same effect is produced by numerous chemical re-agents: thus the alkalis, potash, soda, and ammonia, when added to it in solution, combine with the sulphuric acid and precipitate alumina. It is decomposed by the alkaline earths, lime, barytes, and strontia; and acetate of lead, muriate of lime, &c. &c., decompose it by double decomposition.

Alum sometimes contains sulphate of iron, which is extremely injurious in certain applications of alum. It is readily detected by the addition of a solution of ferrocyanate of potash, which precipitates Prussian blue when oxide of iron is present.

Alum is employed for a vast number of purposes. It is used in lake colours, dyeing, calico printing, leather dressing; and by candle-makers to harden the tallow and render it white. It is an ingredient in making pyrophorus, as will be hereafter described; and in medicine it is employed as an astringent.

ALUM SLATE, a rock from which, as its name implies, alum is prepared. It is found in Germany, Sweden, &c., and in Yorkshire a stratum occurs, which, according to Mr. Winter, (Nicholson's *Journal*, No. 25, p. 241,) is twenty-eight miles in length, extending from ten miles to the southward of Whitby, to eighteen miles to the northward; the cliffs are in general precipitous, and their height is from 100 to 750 feet. The colour of this slate is bluish-grey: its hardness varies; at the top part of the stratum, it may be crumbled between the fingers; whereas at a considerable depth, it is as hard as roofing slate. The specific gravity is about 2·48. By exposure to the air it effloresces, and acquires the taste of alum. Alum slate has not been accurately analyzed; it contains silica, alumina, and, before efflorescence, probably pyrites or bisulphuret of iron.

At Hurlett near Paisley, and Campsie near Glasgow, alum is manufactured from what appears to be *slate clay*, impregnated with bisulphuret of iron; it is obtained from old coal-pits, and having been long exposed to air and moisture, sulphate of iron and sulphate of alumina are formed, and crystallize so as completely to destroy the texture of the slate.

This double sulphate of iron and alumina occurs in the form of soft delicate fibres, easily separable from each other; it is nearly colourless, of a silky lustre, and resembles asbestos in appearance. It is readily soluble in water, the solution yields crystals of sulphate of iron, and when potash salts are added to the remaining solution of sulphate of alumina, crystals of alum are immediately formed, and this is the process of alum-making already noticed. According to the analysis of Phillips, (*Annals of Philosophy*, 21—426,) this double sulphate or ferro-sulphate of alumina consists of

Sulphuric acid . . .	30·9
Protoxide of iron . .	20·7
Alumina	5·2
Leaving for water . .	43·2
	100·0

When this double salt has been dissolved, the remaining slate is exposed in heaps to air and moisture, and by their action upon the pyrites, further quantities of the salt are obtained.

ALUM STONE, a mineral which occurs in a secondary rock at La Tolfa in Italy, and is there used in the preparation of alum: it is found in small masses and veins, and according to Cordier it exists in most burning volcanoes. It is said to be met with also in Tuscany and Hungary.

This mineral is either massive or crystallized; the former is usually greyish-white, and sometimes red. It is translucent, easily frangible, scratches calcareous spar, but is scratched by fluor spar. When heated by the blowpipe it decrepitates, and by continuing the heat emits a sulphureous smell.

The crystals are generally situated in the cavities of the massive substance; they are small, shining, sometimes externally brownish; their form is an obtuse rhomboid, variously modified.

Both varieties have been analyzed, the massive by Vauquelin, and the crystallized by Cordier; the results are,

Massive.		Crystallized.	
Sulphuric acid . .	25·00	Sulphuric acid . .	35·495
Alumina	43·92	Alumina	39·654
Potash	3·08	Potash	10·021
Silica	24·00	Water, a trace of oxide of iron and loss .	14·830
Water	4·00		
	100·00		100·000

ALU'MINA. The earthy oxide of aluminum, sometimes called argil or the argillaceous earth; it constitutes the larger portion of all clays, and their plastic property is owing to it. The name of alumina is derived from *alumen*, the Latin for alum, the salt from which it is generally obtained in a pure state, by means which will presently be mentioned. Alumina is widely diffused throughout the earth; the adamantine spar or corundum, the ruby and sapphire, are alumina nearly pure and crystallized; these substances have not, however, any of the more obvious properties of common clay, for instead of being amorphous, soft, and diffusible through water, they are crystallized, are among the hardest substances in nature, and will not mix with water. The diaspore is a crystallized mineral, which consists almost entirely of alumina and water; and in North America another hydrate of alumina has been found, and called gibbsite.

The following is the process recommended by Berzelius (*Traité de Chimie*, ii. 369) for procuring pure alumina: dissolve and crystallize alum repeatedly to deprive it of the peroxide of iron which it usually contains; when thus rendered pure, a portion of the alum dissolved in water and added to a solution of potash in excess, gives a precipitate at first, which is afterwards completely re-dissolved. To a boiling solution of the purified alum, add one of carbonate of potash, as long as precipitation takes place; then a slight excess of the carbonate being used, digest with a gentle heat to decompose the subsulphate of alumina formed. Wash this carefully on a filter, and re-dissolve it in muriatic acid; precipitate the clear solution with ammonia or the carbonate, and wash the precipitate, which, when dried with a gentle heat, is hydrate of alumina, and when heated to redness, becomes pure alumina, by losing its water.

If intended for the purpose of solution in acids, it is better to keep the alumina in the state of hydrate, for the heat requisite to deprive it of water, occasions its particles to cohere so firmly, that acids act upon it slowly and with great difficulty.

According to Gay Lussac, pure alumina may be obtained by heating ammonia alum to redness in a platina crucible; thus prepared it is insoluble in acids. (*Ann. de Ch. et de Phys.*, v. 101.)

The properties of alumina are, that it is white, powdery, and light; it has neither taste nor smell, and it adheres to the tongue. Berzelius considers alumina to be composed of 53.3 aluminum and 46.7 oxygen out of 100 parts; hydrogen being reckoned unity, he regards its constitution to be two atoms of aluminum, $13.716 \times 2 = 27.432$, with 3 atoms of oxygen, $8.013 \times 3 = 24.039$; its atomic weight is consequently 51.471. Dr. Thomson states its constitution to be 1 atom of aluminum $= 10$, with one atom of oxygen $= 8$, giving 18 as its atomic weight.

Alumina is insoluble in water, but considerable affinity exists between them, as is shown by the high temperature required to decompose the hydrate. Berzelius (*An. de Ch.* lxxxii. 17) found that 100 parts of anhydrous alumina gained 15.5 of water from a dry atmosphere, and 33 from a humid one; which, on removal to a dry place, were reduced to 15.5.

Alumina shrinks considerably by heat; and Mr. Wedgwood, supposing that the degree of contraction would determine that of the heat producing it, invented a pyrometer on this principle, but it is now ascertained that its indications are fallacious. When alumina is exposed to the heat obtained by a jet of oxygen gas directed on a spirit lamp, it fuses slowly into a clear colourless glass.

Alumina produces no change in vegetable blues or yellows, and consequently shows neither acid nor alkaline properties. When in a finely divided state, and especially when recently precipitated and moist, alumina combines readily with most acids, except the carbonic; but when it has been strongly heated,. it is rendered insoluble in them, it dissolves easily in the solutions of potash and soda, and even those of barytes and strontia, but ammonia takes it up very sparingly.

Nitric and muriatic acids form salts with alumina, which dissolve in water in large quantity, but afford no crystals by evaporation: these acids are applied to no use. Acetic acid unites with alumina, and the resulting acetate is largely employed in calico printing as a mordant: it is generally prepared from alum by double decomposition, either with acetate of lead or of lime. Sulphate of alumina is unimportant, except when considered as entering into the composition of alum.

It is evident from what has been stated with respect to alumina, that it is an exceedingly important substance, whether regarded as a constituent of soils or with respect to its extensive employment in the operations of the dyer, calico-printer, or colour-maker. It is a necessary ingredient in all kinds of porcelain, earthenware, bricks, and tiles.

ALU′MINUM. The base of alumina, and generally regarded as a metal. Davy reduced alumina by voltaic electricity, and by the action of potassium in vapour upon alumina heated to redness. Further attempts were made by Œrsted and Berzelius, but it was first obtained in a perfectly separate state by Wöhler in 1827, who procured it by acting with heat upon chloride of aluminum with potassium; the chlorine combining with the potassium, the chloride so formed was dissolved by water, and the aluminum was left. Aluminum thus obtained is a grey powder, resembling platina in appearance; when burnished it has the lustre of tin; it does not fuse at the temperature of melting cast-iron, and it is a non-conductor of electricity, which is also the case with iron in a finely divided state. When heated to redness in the air, it burns with great vividness, and is converted by the acquisition of oxygen into alumina: in pure oxygen it burns with so great splendor, that the eye can scarcely support it; but in order to produce this effect it must be previously heated to redness; the heat evolved is sufficiently great to fuse the alumina partially, and it is then as hard as corundum.

Aluminum does not decompose water until it is heated to ebullition, and then decomposition is slowly effected. Neither sulphuric, muriatic, nor nitric acid dissolve aluminum when cold, but when heated they act upon it quickly. It dissolves very readily even in a weak solution of potash, with the evolution of hydrogen gas. Solution of ammonia also dissolves it. With oxygen, as already noticed, aluminum forms alumina; combined with chlorine, the result is a deliquescent chloride. Sulphuret of aluminum may be procured by dropping sulphur upon heated aluminum; it is a black powder, which decomposes by exposure to the air, and which, when put into water, deposits alumina and evolves sulphuretted hydrogen.

ALURED, ALRED, or **ALFRED,** of Beverley, an English historian, who lived in the twelfth century. He is the author of an Epitome of British History, from the time of the fabulous Brutus to the twenty-ninth year of the reign of Henry I., which Thomas Hearne published at Oxford in 1716, under the title of *The Annals of Alured of Beverley*. It is written in a Latin style remarkable for its correctness, considering the age in which the author lived; and more attention appears to be paid in it to the dates of the events recorded than in most of our antient chronicles. It exhibits, however, in many places so strong a resemblance to the similar work which bears the name of Geoffrey of Monmouth, that Leland, and others after him, have considered it to be merely an abridgment of Geoffrey's work. On the other hand, it would rather seem that Alured's history was really published before that of Geoffrey, so that where they agree in expression, the plagiarism or copying ought probably to be charged upon the latter. Geoffrey's work has always been regarded as principally a translation from a British or Armoric original; and he and Alured may have drawn their information, to a considerable extent, from the same sources. Of the personal history of Alured the little that has been handed down rests entirely on the worthless authority of Bale, in his *Illustrium Magnæ Britanniæ Scriptorum Catalogus, a Japheto, per* 3620 *Annos*. He is said to have been born in the town of Beverley, in Yorkshire; to have received his education at Cambridge, where he became distinguished for his skill in divinity, as well as in various branches of profane learning; and, having afterwards turned secular priest, to have been made one of the canons and treasurer of the church of St. John in his native town. His death is conjectured to have taken place in 1129, the year in which his annals terminate. Bale makes him the author of many other works; but the catalogue appears to be manufactured by the process of representing each of the books of his Annals as a distinct treatise. Among the works that have been attributed to Alured is a history of St. John of Beverley; which the writer of his life in the *Biographia Britannica* considers to be a collection of charters and other records respecting that ecclesiastical foundation still preserved among the Cottonian manuscripts in the British Museum. But for the opinion that this collection is the history said to have been written by Alured, there do not appear to be sufficient grounds.

ALUTA, or **ALT,** a tributary of the Danube, which rises in Transylvania, in the eastern Carpathian mountains, about 46° 40′ N. lat. Its course is at first due south for about 60 miles, when it makes a turn and runs nearly due north for about 20 miles. Its general course is then S.W., S.S.W., and S., till it reaches the Carpathian mountains, through which it makes its way. This pass, called the Pass of the Red Tower, is about 18 miles S.S.E. of Hermanstadt. From the mountains the Alt takes a general south course through Wallachia, forming one of the chief rivers of that province: it joins the Danube nearly opposite the town of Nikopolis, in about 43° 46′ N. lat., 24° 52′ E. long. The whole length of its course is not less than 250 miles, and may be considerably more. The navigation of the river is said to be dangerous. It brings down particles of gold from the auriferous sands in the neighbourhood of the mountains.

ALVA, DUKE OF. [See ALBA.]

ALVAR, a principality in the centre of Upper Hindostan, twenty-five miles south-west of Delhi, north-west of Agra, and between 27° and 28° of north latitude. Alvar is a well-wooded, hilly country, abounding with jungle and with natural fastnesses, of which advantage has been taken by some of the inhabitants to carry on a system of predatory incursions into the neighbouring districts. These people are described as having been formerly exceedingly brutal in their habits; and for this reason it was once customary with some of the native chiefs, when at war, to engage their services, in order the more effectually to ravage the country of their enemies. The principality is now under the dominion of the Rajah of Macherry, whose sway extends over about 3000 square miles. The chief towns in his dominions are Alvar, Macherry, and Rajghur: although Macherry gives the title to the chief, Alvar is the capital.

In 1803, during the war with Scindiah and the Rajah of Berar, Lord Lake concluded a treaty with the Macherry Rajah, who then placed himself under the protection of the British government. Two years after that time, he received a considerable accession of territory at the expense of the Rajah of Bhurtpoor, who, contrary to his engagements, had assisted Holkar in his hostility to the Company's government.

If the inhabitants of this principality were not originally incited to their lawless courses by the oppression of the neighbouring chiefs, there is little doubt that they must have been confirmed in their bad habits by the harsh and cruel measures adopted towards them. Among other restrictions, they were prohibited from cultivating the land in any situation where adequate returns could be expected; their implements of husbandry in such cases were seized and destroyed, and themselves subjected to the most brutal punishments. They were frequently put to a lingering death by being enclosed within four walls. So far were these measures of cruelty from having produced any reformation in the people, that the commission of outrages was continually on the increase; whereas, since the interference of the English government, and the consequent adoption of conciliatory measures, outrages are now of rare occurrence, which were before so frequent that no one could venture to travel from one part of the country to another without a military escort. (Rennell's *Memoir of a Map of Hindostan*, Hamilton's *East India Gazetteer*, and *Parliamentary Reports*.)

ALVAR, a large and strongly-fortified town, situated at the base of a steep hill, in 27° 44′ north lat., and 76° 32′ east long., seventy-five miles S.S.W. from Delhi. This town is in the principality of the same name, and forms at once the capital and the principal residence of the Macherry Rajah. On the summit of the hill at the foot of which Alvar is built, there is a strong fort, 1200 feet above the level of the town.

ALVAREZ, (FRANCISCO,) a Portuguese traveller, was born in the latter part of the fifteenth century, at the town of Coimbra. King Emanuel made him his chaplain. About the year 1512, David, the Emperor of Abyssinia, sent a certain Armenian, by name Matheo, to India, with the view of establishing an alliance with Portugal. Matheo was kindly received by Affonso de Alboquerque, who was then governor of the settlements in India. He was sent to Portugal, and at first considered as an impostor, and treated as such by those who conducted him. On his arrival at Lisbon, King Emanuel rendered him ample justice; and in 1515, he sent Edward Galvaõ on an extraordinary embassy to the Emperor David, and Alvarez was appointed his secretary. After a long voyage, they arrived at the Isle of Camaran, in the Red Sea, where Galvaõ died not long after his arrival.

While Lope Suarez was governor of India, this mission was delayed; but Diego Lopez de Segueira, who succeeded him in the government, perfected what his predecessor had left incomplete. He appointed Rodrigo de Lima ambassador, and confirmed Alvarez in the office of secretary. He told Rodrigo before all the men, 'I send Alvarez with you, and not you with Alvarez; do nothing without first asking his advice, and follow it exactly.'

The expedition landed at Arkeeko on the Abyssinian coast, on the 7th of April, 1520; here they met with a Moor and a Christian. The latter informed them that the country was inhabited by Christians, but that they were subject to the depredations of the Mohammedans. The Christian governor of the country came afterwards with a fine retinue to meet them. The monks of the monastery of Bisam also visited the travellers, and received them kindly in their house. Proceeding on their journey with much fatigue and privation, occasioned partly by the loss of their guide and interpreter, Matheo, who died shortly after entering the Abyssinian territory, they arrived at the emperor's residence in Amhara, after passing through the countries of Tigre and Angot. After some years' residence in that city and country, Alvarez returned to Lisbon on 24th July, 1527. The king rewarded him with a handsome benefice, and ordered him to publish an account of his travels. Alvarez published his work at Lisbon, in one volume folio, with the following title: '*Descripçam das Terras do Preste Joam, segundo vio e escreveo o Padre Francisco Alvarez, capellão del Rey nosso senhor, agora novamente, impresso por mandad do dito senhor em casa de Luis Rodriguez, libreiro de sua Alteza. Lisboa*, 1540. A copy of this volume is in the British Museum.

Alvarez says in his dedication to the king, that he went to Paris purposely to purchase the type for the printing of his manuscript.

In his relation, the traveller speaks more of the country than of himself. The simplicity and frankness with which it is written are admirable. It bears the stamp of truth in every page. It is unfortunate that the writer gives no exact notions of the relative position of places, or of distances, particularly as he traversed and visited the now almost unknown countries of Angot, Amhara, and Efat. Peter Covilham, [see Abyssinia, p. 58,] who was in Abyssinia at the time of Alvarez' arrival, informed him that the Nile (Bahr el Azrek) rose in the kingdom of Gojam, and that he (Covilham) had been sent there on a mission by the Queen Elena. The narrative of Alvarez is generally clear, and he is apparently an honest and trustworthy writer. A French translation appeared of it in 1558, at Antwerp, under the title of *Description Historique de l'Ethiopie*, by Bellère. There is also another in Spanish, by Fray Tomas de Padilla, (Antwerp, 1557,) and Ramusio published it in Italian, in his collection of Travels. We have not seen the latter of these translations; but of the two former, the Spanish is by far preferable to the French. It is surprising that a book of such merit should not have been translated into English. A copy of the original, as well as of the Spanish and French translations, are in the library of the British Museum.

Alvarez died in 1540. He was not a man of very superior talents, but he was undoubtedly an accurate, and, above all, an honest traveller. (See Nicolao Antonio. Mariana, book xxx. ch. 23—25.)

ALVERSTOKE. [See Gosport.]

ALYA'TTES, a king of Lydia, the father of Crœsus; he died about B.C. 562, after a reign of fifty-seven years. Near the Lake Gygæa, which is a few miles north of Sardis (now Sart) in Asia Minor, we still see the immense mound of earth which was raised to his memory. Herodotus, who gives the first account of it (i. 93.) says, that the circuit round the base was 3800 Greek feet, and the width (of the base?) 2600 feet. The height is not given. The lower part of it was a substruction of stone, which is now covered by the earth that has fallen down; but the mound still retains its conical form, and rises up like a natural hill. Its dimensions are much greater than those of any similar monuments in Great Britain. The circuit of Silbury Hill, which forms so striking an object on the Bath road, is inconsiderable when compared with the mound of Alyattes. Other mounds of various sizes are found near the large one, and probably were raised in nory of the antient kings of Lydia. (See Chandler's *wels in Asia Minor.*)

In the reign of Alyattes a great eclipse took place while the Lydian and Median armies were fighting (Herod. i. 74): the place where the eclipse was seen is not mentioned by Herodotus; but we may fairly conjecture it was in the upper latitudes of Asia Minor, and between the Halys and the higher waters of the Euphrates. This eclipse was predicted by Thales of Miletus, but we cannot infer from the words of Herodotus that he predicted the *day*: all that the words of the historian can be made to signify is, that he predicted the year. But Herodotus knew so little of physical science that we must not interpret his words too strictly. Scaliger says this eclipse took place October 1, 583 B.C.: Volney, February 3, 626. Mayer, May, 603. Costard, *Phil. Trans.* 1753, showed, by allowing for the moon's acceleration, that Mayer's eclipse was not seen at all in Asia Minor.

Baily has calculated (*Phil. Transac.* 1811) all the eclipses from B.C. 650 to B.C. 580, and has found only one that was total in or near any part of Asia Minor, viz. 30 Sept. 610. The centre of the moon's shadow passed in the forenoon in a right line over the north-eastern part of Asia Minor, through Armenia into Persia. It passed over the mouth of the river Halys. If the eclipse mentioned by Diodorus to have taken place during the voyage of Agathocles, B.C. 310, be rightly given, a correction becomes necessary for the moon's distance from her node, which being allowed for, *no* eclipse between B.C. 650 and 580 was central or total at or near any part of Asia Minor. Therefore either the date of the eclipse of Agathocles or of Thales is false.

ALYTH, a town in Perthshire, in an extensive parish, which stretches into Forfarshire, includes the Mountains of King's Seat (1238 feet high) and Mount Blair, and the forest of Alyth, and affords a supply of game and fuel. Some parts of the parish are fitted for pasturage of black cattle and sheep. The town is pleasantly situated on a rivulet, running into the Isla, a tributary of the Tay, and at the foot of a hill. It has a well-supplied market, and some manufactures, of linen and yarn. There are several fairs in the year. The church is an ancient Gothic building, in good condition; and besides the usual parochial school, there is one at Drumfork in the parish, established by the Society for Promoting Christian Knowledge. Alyth was constituted a royal burgh in the fifteenth century, but never sent members to parliament. It is 12 miles W. by S. from Forfar. The population of the parish in 1831 was 2888. There are the vestiges of a fortification on a hill near the town.

A'MADEUS I. was the son of Adelaide, Marchioness of Susa, and of Humbert I., Count of Maurienne, in Savoy, called the 'White-handed;' some say he was the son of Oddo, Humbert's son. After his father's death, he governed conjointly with his mother the states of Susa and Maurienne. This made him master of the great pass over the Alps into Italy, by Mont Cenis, from which circumstance much of the subsequent importance of his family was derived. He married a daughter of Gerald, Count of Burgundy. Amadeus, as a feudatory of the empire, was attending the Emperor Henry III. at Verona, when one day he asked admission to the imperial chamber, followed, as was his custom, by a numerous retinue of young noblemen and squires. Henry ordered him to be admitted, but 'without his tail,' meaning his retinue. Upon this, Amadeus refused to enter without his friends. The emperor was not displeased at his boldness, and allowed the whole to come in with their lord. From this circumstance Amadeus was styled *Caudatus*. Amadeus was mainly instrumental in bringing about a reconciliation between Henry IV. and Pope Gregory VII., and thus putting an end to the disastrous contest between the church and the empire. He died soon after, in 1078, and was buried in the cathedral of St. Jean de Maurienne.

AMADEUS II., styled by some III., as they suppose another Amadeus, either before or after Amadeus I., of whom, however, they give us no account. This has occasioned some confusion in the early genealogy of the House of Savoy. He succeeded his father Humbert II., Count of Maurienne, in 1103. He accompanied Henry V. to Rome, where the latter was crowned emperor. As a reward for his fidelity, Henry gave him the title of Count of Savoy, and vicar perpetual of the empire. Amadeus also took the title of Marquis of Turin; and married the daughter of the Count or Dauphin, as he was called, of Vienne, on the Rhone. His differences with Louis VII., King of France, who was Amadeus' cousin by his mother's side, were settled by the mediation of St. Bernard, the famous Abbot of Clairvaux, who persuaded Amadeus to take the cross, and accompany the king to the Holy Land, which expedition, however, turned out unsuccessful. Amadeus distinguished himself at the siege of Damascus, and relieved Acre, which was besieged by the Turks. On his return from Syria, he landed in the island of Cyprus, where he died at Nicosia, of a fever, in 1148. The celebrated Abbey of Hautecombe, where are the sepulchres of the House of Savoy, was founded by him in 1125.

AMADEUS III. succeeded, in 1233, his father Thomas, as Count of Savoy, and his brother inherited Piedmont. Amadeus obliged the Count of Genevois to acknowledge himself his vassal: he also conquered the Chablais and the Lower Valais; and sent troops over the Little St. Bernard into the valley of Aosta, and subjugated that country. The Emperor Frederick II., on his passage through Turin, was sumptuously entertained by Amadeus, to whose titles he added on this occasion those of Duke of Chablais and of Aosta. Amadeus died in 1246.

AMADEUS IV., called 'the Great,' succeeded his uncle Philip in 1285. By his marriage with Sybilla, Countess of Bugey and Bresse, these districts of ancient Burgundy were united to his states. He interfered in the disputes between the Counts of Genevois and the Bishop of Geneva, and protected the city from the encroachments of the Counts. The town and district of Ivrea gave itself up to him by common consent of the citizens. He inherited the barony of Faucigny by the will of Beatrix, the last of her family, but he had to defend his claims by arms against the Dauphin of Vienne. This was the origin of long wars between the two states. Amadeus afterwards embarked for the East, where he assisted in the defence of Rhodes against the Turks in 1315. It was on this occasion that he assumed the white cross on his arms and banner, which has ever since remained the ensign of Savoy. He died in 1323 at Avignon, where he had gone for the purpose of urging Pope John XXII. to proclaim a new crusade.

AMADEUS V. succeeded his brother Edward in 1329, continued the war against the Dauphin of Vienne, and died in 1342. He has been called Aymon by the same historians who have anticipated one number in the list of the former Amadeuses. They all agree in calling the following, Amadeus VI. The names of Aymon and Amadeus were frequently confounded in the countries of ancient Burgundy.

AMADEUS VI., son and successor of the preceding, was called 'the Green Count,' from the colour of the dress in which he appeared, when only fourteen years of age, at a great tournament given at Chambery, where he won the prize. In 1349 Humbert, last Dauphin of Vienne, disgusted with the world in consequence of the death of an only son, gave up his title and principality to Charles, grandson of Philip of Valois, and retired into a Dominican convent.

From that epoch the eldest son of the King of France has been called Dauphin, and the province Dauphiny. Amadeus VI. was not pleased at this cession, which gave him a much more formidable neighbour than he had before; and a war ensued, in which Amadeus defeated the French in 1354. A treaty was concluded at Paris the following year, by which the Count of Savoy gave up to France the districts he possessed in Dauphiny beyond the rivers Rhone and Guier; and he, on his part, was acknowledged undisputed sovereign of Faucigny and the country of Gex, as well as suzerain lord over the Counts of Genevois, all which titles had been till then subjects of contention between the Counts of Savoy and the Dauphins of Vienne. Amadeus was next engaged in a war against the two brothers, Barnabas and Galeazzo Visconti, who had attacked the Marquis of Montferrat. He marched to the assistance of the latter, and drove away the forces of the Visconti. He also obliged the Marquis of Saluzzo to pay him homage. He thus extended his dominion on the Italian side of the Alps. Amadeus's alliance was courted by the principal sovereigns of his time. John Palæologus, Emperor of Constantinople, and Amadeus's cousin by his mother's side, being threatened by the Bulgarians and the Turks, who had taken Adrianople, implored the assistance of the western princes. The pope proclaimed a crusade, but the Count of Savoy alone answered the call. At his own expense he assembled a number of galleys in the port of Venice, where he embarked with a chosen band of his own knights, and a considerable number of archers and other infantry, all dressed in green. He arrived at Coron in the Morea, in July, 1366, and from thence he proceeded to Gallipoli, where Sultan Amurath had placed a garrison. The town was taken, and the white cross of Savoy hoisted on its ramparts. From Gallipoli he proceeded to Constantinople, where he found the people in great confusion, the Emperor Palæologus being a prisoner in the hands of the Bulgarians. Amadeus sailed again for the Black Sea, landed on the Bulgarian coast, took Mesembria by storm, and attacked Varna. The Bulgarians now sued for peace, and as a first condition delivered Palæologus, who returned to Constantinople with Amadeus. The latter, however, soon after quarrelled with the Greek emperor, whom he was endeavouring, but in vain, to restore to the bosom of the Roman or Western church. An interesting account of this expedition from the original MSS. was lately published by Pietro Datta, of Turin. On his return to Italy, Amadeus found that the Visconti had availed themselves of his absence to invade again Montferrat and Piedmont, although Galeazzo Visconti had married Blanche, Amadeus's sister. Amadeus soon obliged them to retire and to raise the siege of Asti. The Emperor Charles IV., on his passage through Chambery, was splendidly entertained by Amadeus, who did homage as Duke of Aosta and Chablais, Marquis of Susa, and imperial Vicar, according to feudal usage, by throwing the banners of those jurisdictions to the ground before the emperor; 'but when the sixth banner came forth, which was that of the white cross, the Count of Savoy entreated the emperor not to allow it to be lowered, saying that it had never been lowered yet to the ground, and never should, so please God.' (Paradino, *Chronique de Savoie.*) Amadeus had now risen to great power and influence, and was looked upon as the arbiter of Italy. The Venetians and the Genoese had long quarrelled about the possession of the Island of Tenedos, in the Ægean Sea; but at last agreed to give it in full possession to the Count of Savoy. Amadeus in his old age was still thinking of another expedition against the Turks, but the Pope Clemens VII. persuaded him first to accompany Louis Duke of Anjou in his expedition to Naples, to which kingdom he was called by the adoption of Queen Joanna I. Amadeus went in 1382, and shared in the first successes of Louis, who conquered the Abruzzi and Apulia. A contagious disease, however, spread through the army, and the Count of Savoy was one of its earliest victims. He died at Santo Stefano in Apulia, in 1383. He was the founder of the Order of the Annonciade.

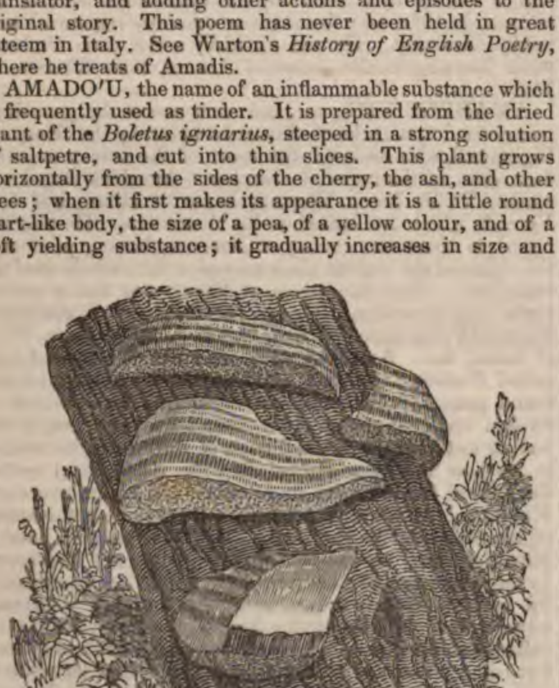
AMADEUS VII., called 'the Red Count,' succeeded his father, Amadeus VI. He made the important acquisition of the county of Nice, by the unanimous wish of the citizens, in 1388, and the act was solemnly registered as a public document. He was killed by a fall from his horse while hunting in the forest of Lornes, near Thonon, in 1391.

AMADEUS VIII., son and successor of the preceding, was created first Duke of Savoy, in 1416, by the Emperor Sigismund, who declared the court of the dutchy to be independent of the imperial chamber. Amadeus waged war against Philip Maria Visconti, Duke of Milan, and took Vercelli, which he united to his dominions. He also annexed to them the county of Genevois, having purchased the rights of the various claimants after the extinction of the male line. Thus the whole of Savoy was finally united under one sovereign. He was also Prince of Piedmont, Baron of Vaud, Lord of Nizza, Mondovi, and Valenza, Duke of Aosta, &c. Amadeus gave his subjects a code of laws called *Statuta Sabaudiæ.* Under him Savoy enjoyed profound peace, whilst the countries around were a prey to foreign and civil wars. After forty-three years' reign, and having lost his wife, Maria Beatrix of Burgundy, he retired, in 1434, to the hermitage of Ripaille, a delightful spot on the Lake of Geneva, with six of his nobles, whom he created Knights of St. Maurice. He entrusted the administration of his states to his son Louis. For five years he lived at Ripaille, where he was consulted in matters of importance by his son as well as other sovereigns; and here he mediated the peace of Arras between France and England. The council assembled at Basle, having deposed Eugenius IV. in 1439, called Amadeus to the Papal chair. Amadeus at first refused, but being persuaded by the Cardinal of Arles, he assumed the pontifical dignity with the name of Felix V. At the same time he definitively abdicated his temporal sovereignty to his son Louis. In June, 1440, the new pope proceeded to Basle, where he was solemnly crowned. France, England, Spain, Germany, and Lombardy, acknowledged him as pope, whilst the rest of Italy and the Venetians supported Eugenius, who continued to reside at Rome. The schism lasted nine years, but Eugenius having died, the Cardinals who were at Rome elected Nicholas V., when Felix himself proposed to renounce his rights to Nicholas, and thus terminate the scandal of the church. This arrangement was effected in 1449, and Felix having solemnly deposed the tiara, and having received the title of Cardinal Legate, retired again to his favourite Ripaille, where he met his six old companions, and appeared as forgetful of the pomps and cares of the papacy as he had been of those of his temporal sovereignty. He died in January, 1451, at Geneva.

AMADEUS IX., Duke of Savoy, succeeded his father Louis in 1465. He was called 'the Pious,' from his goodness and charity to the poor. He married Yolande of France, sister of Louis XI. He reigned only eight years, and died at Vercelli in 1472. A few hours before his death he assembled his council and recommended them 'to administer impartial justice, and to love the poor.' He was succeeded by his son Philibert. Louis, Amadeus' brother, was for a while king of Cyprus, but his title to that kingdom was disputed. As heirs of Louis, however, the kings of Sardinia still assume the title of Kings of Cyprus.

A'MADIS DE GAULA, the hero of an old romance of chivalry, written in Spanish prose by Vasco Lobeira, towards the end of the twelfth century. It was afterwards corrected and edited in more modern Spanish by Garcia Ordoñez of Montalvo, about the beginning of the sixteenth century, and became a very popular book in Italy and France; it was translated into French by D'Herberay, and printed in 1555, with many additions, under the mis-translated title of *Amadis des Gaules*, meaning France. In the original Spanish romance, Gaula is Wales; and the subject, characters, and localities, are British. The story alludes to fabulous feats between the Welsh and the English, previous to those of Arthur and the Knights of the Round Table; the Romans and Saxons are united against the Prince of Gaula or Wales, and the Saxons are represented as faithless and treacherous. It is probable that Vasco Lobeira took the groundwork of his story from some older British or Welsh legend. The *Amadis* is considered as one of the most interesting works in the whole library of chivalry and romance. There are also several other Spanish romances concerning Amadis and his family, which are, however, deservedly forgotten. Bernardo Tasso, the father of Torquato, wrote a poem on the subject of the Amadis de Gaula, which he called *Amadigi di Francia*, copying the mistake of the French translator, and adding other actions and episodes to the original story. This poem has never been held in great esteem in Italy. See Warton's *History of English Poetry*, where he treats of Amadis.

AMADO'U, the name of an inflammable substance which is frequently used as tinder. It is prepared from the dried plant of the *Boletus igniarius*, steeped in a strong solution of saltpetre, and cut into thin slices. This plant grows horizontally from the sides of the cherry, the ash, and other trees; when it first makes its appearance it is a little round wart-like body, the size of a pea, of a yellow colour, and of a soft yielding substance; it gradually increases in size and hardness till it becomes of a darkish brown, and is as large as an apple. It afterwards takes a horizontal direction, forms a border and becomes covered with numerous closely-packed tubes on its under surface, which are exceedingly minute. When the plant is full grown the tubes are of a reddish brown colour, and of a hard woody texture; and the upper surface is of various colours disposed in grey, brown, or clouded concentric elevated circles. The plant is perennial, and increases yearly in size.



[Boletus igniarius.]

AMAGER, or AMAK, a small island in the Baltic, lying opposite to Copenhagen, with which it is connected by two bridges. It is about nine miles long, and on an average three broad; quite level, and without wood or good water. The soil is fertile, and the island supplies Copenhagen with garden vegetables, milk, butter, and cheese. A Dutch colony from the Water-land in North Holland was invited here in 1516 by Christian II. Of the two parishes, that on the east side of the island, called Hollanderbye, is the proper settlement of the Dutch colony. The language of the people is a mixture of Dutch, German, and Danish. The inhabitants, in summer, send their cattle to pasture on the adjacent low island of Saltholm.

A part of Copenhagen, called Christianshafen, is on the island of Amager. (See COPENHAGEN.)

AMALARIC, the last Visigoth king of Spain, was the son of Alaric II. and grandson of Theodoric II. At the death of his father, A.D. 506, he was only five years of age; and Gensaleic, a bastard son of Alaric, was elected king of the Goths in Spain. Theodoric, who was then in Italy, sent his general Theudis with a powerful army to protect the rights of his grandson. Gensaleic was defeated, and Theudis was entrusted with the guardianship of the child and the government of Spain. When Amalaric became of age he was acknowledged king of the Goths both in Spain and in Gothic Gaul. In order to secure his French possessions he solicited and obtained the hand of Clotilda, daughter of Clovis, king of the Franks. But this marriage proved in the end an unfortunate one. Amalaric was a violent Arian, and Clotilda a zealous Catholic. At first each attempted to convert the other, but all their mutual endeavours having failed, Amalaric tried to obtain his object by violent means. He so ill-treated his unfortunate queen, that at last she was compelled to apply to her brothers for protection against her cruel husband. The French historians say, that she was so barbarously treated, that the violence offered to her by her husband frequently occasioned her blood to flow, and that she sent her brothers a handkerchief steeped in it as a testimony of her sufferings. But this statement is not confirmed by the contemporary writers. Her brother Childebert, or Childibert, king of Paris, mustered a large army and marched against his brother-in-law. The two armies met, according to some authors, in Gothic Gaul, and according to others in Catalonia. Both French and Spaniards fought with equal valour and obstinacy. At last the Spaniards were defeated, and Amalaric took refuge in a church, where he was killed, in the year 531. The conqueror, after having plundered the Arian churches, returned to France with his sister.

Amalaric was the last of the Visigoth kings, and the first who established the court at Seville. On his death, Theudis, an Ostrogoth or eastern Goth, was elected king. [See Mariana, book v. ch. 7. Procopius, *De Bello Gothorum*, lib. i.]

AMALEKITES, a nation who dwelt south-west of Palestine, between Edom and Egypt (Gen. xiv. 7; Exod. xvii. 8-16; 1 Sam. xv. 7). According to Josephus, *Antiquities*, iii. 2, those who dwelt in Gobolitis and Petra were called Amalekites, and were the most warlike among the surrounding nations. The Gobolitis of Josephus is the Gebala or Gabala of Stephanus Byzantinus, and the Gabalene of Eusebius. Its inhabitants are called Gabalitæ and Gebaleni. According to Burckhardt, the country between the Dead Sea and Wady Mousa is still called *Jebâl* or *mountain*. Gobolitis means the *high-land*, especially the mountainous country near Petra. The following passage (Jos. *Ant.* II. 1. § 2.) will illustrate our statement. 'Aliphaz had five legitimate sons, Theman, Omer, Ophus, Jotham, and Okanaz, for *Amalek* was illegitimate, being born of a concubine whose name was Thamna. These inhabited that part of Idumea which is called *Gobolitis*, and that which, after Amalek, was called Amalekitis.' Josephus calls their country *Amalekitis*, and describes it as a part of *Idumæa*. (*Ant.* ii. 1.) Josephus also calls the country of Madian Amalekitis, and says, that it was situated between Pelusium, on the borders of Egypt, and the Red Sea. (*Ant.* vi. 7: § 3, and ch. 8.) It appears also that they occupied several places in Palestine among the Canaanites, just as some Sclavonic Wendish settlements are found among the Saxons in Germany. In the land of Ephraim we find a mountain of the Amalekites where Abdon, the son of Hillel, was buried in Pirathon. There dwelt also many Kenites among the Amalekites, whom Josephus names Σικιμίται. (1 Sam. xv. 6; *Ant.* vi. 8; Judges xii. 15; compare v. 14.)

We read in Gen. xiv. 7, that Amraphel, king of Shinar, Arioch, king of Ellassar, Chedorlaomer, king of Elam, and Tidal, king of nations, came to Enmishpat (*Fountain of Judgment*), which is *Kadesh*, and smote all the country of the Amalekites. Kadesh is placed, in Asheton's *Historical Map of Palestine*, in 34° 58′ E. long. and three minutes N.N.E. of Enmishpat; but Moses informs us, that *Enmishpat* is *Kadesh*. According to Rabbi Sh'lomo Ben Jarchi, 'the country of the Amalekites' means, in Gen. xiv. 7, the country which was *afterwards* inhabited by the Amalekites; as we might say that Cæsar went into *France*, because Gaul was afterwards occupied by the Franks, or as Jacob set his face to mount *Gilead*, although this name of Gilead is of a later date. This opinion has been generally adopted; for Amalek, one of the dukes, that came of Eliphaz, the son of Esau, in the land of Edom was considered the progenitor of the Amalekites, and therefore they could not exist in the days of Abraham. Gen. xxxvi. 1, 12, 16. But the name of Amalek was, perhaps, given to two different nations. The Arabians mention *Imlik*, *Amalik*, or *Amaleka* among the aborigines of Arabia, the remains of which were mingled with the descendants of Joctan and Adnan, and became Mostarabs or Mocarabes, that is, Arabians mixed with foreigners; and they give these names also to the Canaanites and Philistines, which nations were probably related to each other. According to Arabian writers, the inhabitants of North Africa were descended from the Amalekites, who were expelled by Joshua. This assertion has probably some reference to the Carthaginians being a Phœnician colony. (D'Herbelot, *Bibl. Or.*, art. *Amlac;* Abulfeda in Pococke's *Spec. Hist. Arabum*, ed. White, pp. 464, 465.)

Some Arabians make Amalek a descendant of Ham, and father of Aad; but Abulfeda (*Historia Anteislamica, ed. Fleischer*, p. 16) makes him descend from Shem. Ebn Arabshah (in *Vita Timuri*, ed. Manger., ii. 780) calls Amalek *the great*, on account of his descent from the giant race of Ham. (Comp. Relandi *Palæstina*, p. 78-82; J. D. Michaelis, *Spicilegium Geographiæ Heb. Externæ*, t. i. p. 170-177; Alb. Schultens' *Monum. Ant. Hist. Arabum;* Gesenius in *Ersch und Gruber*.)

The Amalekites were the first who opposed the Israelites on their march from Egypt. (Exod. xvii. 8-13; Jos. *Ant.* iii. 2.) They suffered great loss, but were afterwards assisted by the Canaanites, and obtained a great victory. (Num. xiv. 39-45.) During the time of the Judges, the Israelites were frequently oppressed by the Amalekites, Ammonites, and Midianites. (Judges iii. 13; vi. 3; Joseph. v. 7.) Saul gathered 200,000 footmen and 10,000 men of Judah, and came to the city of Amalek, (the name of which is unknown,) and laid waste the valley, and said unto the Kenites, 'Go, depart, get you down from among the Amalekites, lest I destroy you with them; for ye showed kindness to all the children of Israel, when they came up out of Egypt;' or, as Josephus says, he spared them because they were related to Reguel, the father-in-law of Moses. So the Kenites departed from the Amalekites; and Saul smote the Amalekites from Havilah to Shur, that is over against Egypt. Saul took their king Agag alive, who was cut to pieces by the prophet Samuel. Saul was rejected from being king because he had spared Agag and the best cattle of the Amalekites. (1 Sam. xv.; Jos. *Ant.* vi. 8.) David warred against them (1 Sam. xxvii. 8.); and therefore the Amalekites plundered the town of Ziklag and set it on fire, but David overtook them in the wilderness, and recovered all that they had carried away. (1 Sam. xxx. 18; *Ant.* vi. 15.)

At a later period, David dedicated silver and gold unto the Lord, which he had taken from Amalek and other subdued nations. (2 Sam. viii. 12.) The Amalekites were finally extirpated by the Shimeonites, who occupied their country during the reign of Hezekiah. (1 Chron. iv. 43.) Thus, according to the direction of Moses, the remembrance of Amalek was blotted out from under heaven, because they slew the hindmost of the Israelites who fainted in the wilderness. (Deut. xxv. 17, 19.) But it seems that some of them escaped to neighbouring countries, where they continued to hate the Israelites, for we find that Haman, the *Agagite*, being, probably, a descendant of Agag, king of the Amalekites, endeavoured to destroy Israel in the empire of Ahasuerus. (Esther iii. 1.)

The name עמלק has been derived from לקק, or ילק, and explained to be a people which *licks up* or *taketh away* everything, like יֶלֶק, *the locust;* or, from לקה, *a people which beats down;* or, more probably, from מלק, for מלך, *a people which reigns, a royal nation, a nation of the king, a set of royalists.* The name of the Amalekites may be descriptive of their prowess; and Balaam's saying, (Num. xxiv. 20,) 'Amalek was the first of the nations,' seems to express dignity rather than antiquity, *the most eminent of the nations.*

AMALFI, a town in the kingdom of Naples, built on the steep declivity of a mountain overlooking the Gulf of Salerno, 40° 37′ N. lat., 14° 35′ E. long. In the early part of the middle ages, Amalfi was a republic, with a scanty territory, but renowned for its trade with Egypt and the East. It took part in the crusades, and its citizens founded in Palestine the hospital of St. John of Jerusalem, from which the celebrated military order took its name. Amalfi was taken about the end of the eleventh century by Robert Guiscard, the Norman Conqueror, at the same time as Salerno, and was erected into a duchy. William of Apulia, the poet historian, describes Amalfi at that time as the great mart for eastern goods, frequented 'by Arabs, Indians, Africans, and Sicilians.' In the subsequent wars between the Normans and Pope Innocent II., who was supported by the Emperor Lotharius, Amalfi was taken, in 1137, by the Pisan fleet, who were auxiliaries of the emperor. It was on this occasion that a solitary copy of the Pandects of Justinian, a work long lost to the world, is said to have been found by the Pisan conquerors amidst other plunder within the walls of Amalfi, and from that epoch the study of the Roman law was revived in Europe. Flavio Gioia, a citizen of Amalfi, found out the mariner's compass about the beginning of the fourteenth century; he probably derived the first idea of it from some eastern trader, it having been used in a rude form in the Indian seas long before. The present town of Amalfi, though much fallen from its former splendour, still retains some remains of trade, and its inhabitants are reckoned good mariners. It has a very antient cathedral, and stands in a romantic position, thirteen miles W.S.W. of Salerno.

AMALGAM, a compound of two or more metals, of which one is always mercury; and this circumstance distinguishes an *amalgam* from a mere *alloy*. Nature presents us with only one amalgam, which is of silver, and is termed by mineralogists *native amalgam:* it occurs in Hungary, Sweden, &c., and is met with either semifluid, massive, or crystallized in rhombic dodecahedrons. Klaproth found it to consist of 64 parts of mercury and 36 of silver, out of 100 parts. Most metals may be amalgamated with mercury, and the combination appears to depend on chemical affinity. When the cohesion of a metal is slight, as in the cases of potassium and sodium; or when its affinity for mercury is considerable, as in the instances of gold and silver, amalgamation takes place readily by mere contact. When, on the other hand, the cohesion of a metal is strong, or its affinity for mercury is weak, heat, or intermediate action, or both, are requisite to effect amalgamation.

There are several circumstances which show that amalgamation is the result of chemical affinity; the crystalline form of the native amalgam is strongly indicative of it, and it is confirmed by analysis: for if the quantities of mercury and silver were 64 of the former and 35·2 of the latter metal, instead of 36, as abovementioned, they would be in the proportions of 200 to 110, or 1 atom of each.

The phenomena also, which accompany the action of mercury upon other metals, evince its chemical nature: if 44 parts of mercury be mixed with 1 part of potassium, combination occurs with the evolution of much heat, and when the resulting amalgam is cold, it is hard, and has the appearance of silver: when the quantity of mercury exceeds 100 parts to 1 part of potassium, the compound is liquid; and an amalgam containing only 1·5 per cent. of potassium is susceptible of crystallizing. The density of an amalgam exceeds that of the mean of the metals; this and the tendency exhibited by one or both metals to oxidize, are additional indications of chemical combination. If mercury and lead be shaken together in a bottle containing atmospheric air, its oxygen is absorbed, and a black powder is formed which contains an oxide of one metal or of both of them.

There are some metals, it has been already observed, which require heat in order to amalgamate them; of this, antimony offers an example. In order to effect combination, it must be melted, and while liquid mixed with hot mercury. Mere heat, however, causes scarcely any action between iron and mercury. It has been stated, that they may be amalgamated by mixing the filings of the metal with powdered alum, and rubbing them together in a mortar with a little water: after trituration the alum may be washed out. By the intervention of tin or zinc, iron may be combined with mercury, and a double amalgam is formed. Platina also unites with mercury by the intervention of the amalgam of potassium; but not by direct action.

Having stated some examples of the different modes in which amalgams may be formed, we shall notice their general properties. Amalgams are either liquid, soft, or hard; their form being dependent, in some cases, upon the quantity of mercury employed; and, in others, upon the nature of the metal amalgamated: thus an amalgam consisting of 80 parts of mercury and 1 part of sodium is solid, whilst a compound of 15 parts of mercury and 1 part of tin is liquid. The liquid amalgams resemble mercury in appearance, except that the greater part of them flow less readily: solid amalgams are brittle. In general, amalgams are white; they are all crystallizable, and then form compounds of definite proportions. To prove this, it is only requisite to dissolve a proper quantity of a metal in mercury with heat, and to allow the amalgam to cool; it then separates into two portions, one of which is liquid and the other is solid and crystallized; the fluid portion may, however, be regarded as a solution of the definite compound in an indefinite excess of mercury. The amalgams of the more oxidable metals, as of potassium and sodium, are decomposed by exposure to the air and absorbing oxygen, and they decompose water with the evolution of hydrogen gas; the double amalgam of iron and zinc does not rapidly undergo any change, and is not attracted by the magnet. All amalgams are decomposed by a red heat, the mercury being distilled, and the more fixed metals remaining. The process of amalgamation and decomposition is employed to separate gold and silver from their ores; the mercury obtained by decomposing the amalgams is distilled and repeatedly used for the same purpose, with comparatively little loss. The amalgams of gold and silver are employed in the processes of gilding and plating. The amalgam of tin is largely used in what is termed silvering mirrors, and various amalgams of tin and zinc are employed for exciting electricity in the machine. These compounds, as well as other amalgams, will be treated of under each particular metal. Some curious effects result from the action of amalgams upon each other: if mercury be added to the liquid amalgam of potassium and sodium, an instant solidification ensues, and heat enough to inflame the latter metals is evolved. When, on the other hand, a solid amalgam of bismuth is put in contact with one of lead, they become fluid, and the thermometer sinks during their action. There is a curious compound called an amalgam of ammonia, the real nature of which has not been satisfactorily explained. When mercury is negatively electrified in a solution of ammonia, or an amalgam of mercury and potassium is placed upon moistened muriate of ammonia, the metal increases in volume and becomes of the consistence of butter; this appearance has been supposed to be owing to the combination of a metal, which Berzelius calls *ammonium*, with mercury. When thrown into water it effervesces copiously, hydrogen gas is given off, and ammonia remains in solution. Gay-Lussac and Thenard have maintained the opinion that the amalgam consists of mercury united to azote and hydrogen; the latter being in larger proportion than in ammonia.

AMALIA, wife of the Duke of Saxe Weimar, lost her husband when she was hardly twenty years of age, and found herself at the head of the government in troubled times, during the wars between the two great German powers, Austria and Frederic of Prussia. The Duchess of Weimar, however, contrived to direct in safety the affairs of her little state, and after the restoration of peace she turned all her thoughts to the internal improvement of her country. The city of Weimar became the resort of the most distinguished literary men of Germany, whom the Duchess encouraged by her liberal patronage to come and reside at her court. Wieland, Herder, Schiller, and Goethe, formed a constellation of genius of which any city might be proud. Wieland was appointed tutor to the two sons of the Duchess. Goethe was also induced to settle at Weimar, where he resided ever after, and filled a distinguished place in the ducal council. Herder was appointed court chaplain, consistorial councillor, and inspector of the schools. The Duchess Amalia withdrew from public life in 1775, having given up the sovereign authority to her eldest son, then of age: she retired to her delightful country residence of Tieffurth, where she continued to surround herself with men of talent and learning. She travelled into Italy in 1788, and returned from that country with an increased taste for the arts, especially for music. The Duchess was a sincere patroness of genius, which she delighted in discovering and raising from obscurity and poverty. She died in 1807, regretted by all who knew her.

AMAND LES EAUX, St., a town in France in the department of Nord, on the river Scarpe, and on the road from Lille to Valenciennes, about seven miles N.W. of the latter. The population amounts to about 9000; and the inhabitants carry on a considerable trade in oil, and in thread made of the flax grown in the neighbourhood. There are manufactures of porcelain, of lace, and of leather. There are some mineral waters and baths about half a league from the town, in a marshy plain, and nearly surrounded by the wood of St. Amand. The town was ceded to France by treaty in 1714, and previous to the French Revolution it contained an abbey with a considerable ecclesiastical establishment. The abbey church is much admired for its architecture.

Another town of the same name usually distinguished as ST. AMAND MONT ROND, is in the department of the Cher, and on a tributary of the river Cher, not far from its junction. It has a population of 6000 persons, who are chiefly occupied in trade; it is one of the most commercial towns in the department, and is the mart of the grain, wine, chestnuts, ship-timber, and cattle of the district: in the season a considerable quantity of mushrooms is gathered. There are some iron works here. It is 25 miles south of Bourges, and 156 south of Paris.

This town was built in the year 1410, on the ruins of a place called Orval, which the English had burned. It is the capital of an arrondissement.

There are several other small places of this name in different parts of France.

AMA'NUS, a chain of lofty mountains separating Cilicia from Syria. [See TAURUS.] The name Amanus was given by the Greek and Roman geographers, and is also sometimes applied by modern geographers to the range which, beginning at the mountain of Cape Hynzyr on the Gulf of Scanderoon, runs in a north-eastern direction into the interior.

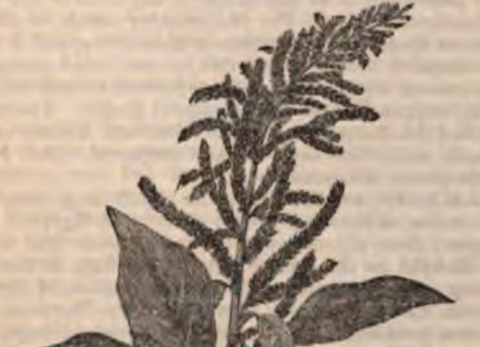
AMARA, or AMARASINHA, an antient Hindu grammarian, and author of one of the oldest and most esteemed original vocabularies of Sanskrit nouns, called after his name *Amara Kosha*, i. e. the Thesaurus of Amara, but sometimes quoted under the title of *Trikanda*, i. e. the Tripartite. Owing to the almost total want of records on the internal history of India, the æra at which Amara lived can only be ascertained by conjecture. Numerous authorities assert that he was a contemporary of King Vikramaditya; and his name is included in a memorial verse among the Nine Gems, or nine distinguished poets and scholars who adorned the court of that prince. The exact date of this Vikramaditya's reign is, however, still subject to discussion, as in Indian history several kings of that name occur. Tradition places Amara and the Nine Gems generally under the first Vikramaditya, 56 years before our æra. Mr. Bentley (*Asiatic Researches*, vol. vii. p. 242-244) supposes the Vikramaditya under whose reign Amara lived, to be the successor of Raja Bhoja-deva, as sovereign of Dhara in Malwa, who reigned during the latter part of the eleventh century. Mr. Colebrooke, (*Algebra from the Sanskrit, Introd.* pp. 45-51,) from astronomical data in the work of Varahamihira, (another of the Nine Gems,) has assumed the close of the fifth century, or about the year 472, as the probable epoch when that astronomer wrote, and Vikramaditya and the Nine Gems lived. This opinion, with regard to Amara, is supported by the frequent reference made to his Dictionary as to an antient and classical work of standard authority, by numerous writers, to many of whom an antiquity of several centuries at least can be confidently attributed.

Of Amara's life little is known. He embraced the tenets of the Bauddhas, a heterodox sect; and all his compositions, with the exception of his Dictionary, perished in the persecutions raised by the Brahmans against the persons and writings of the Bauddhas, which began in the third century, and reached their height during the fifth and sixth.

Like other original Sanskrit vocabularies, that of Amara is in metre, to aid the memory. The whole is divided into three books. In the first two words relating to kindred objects are collected in one or more verses, and placed in chapters. Thus the first book commences with words for heaven; next follow the names and attributes of the several deities; then come terms for space, the cardinal points of the compass, &c. The third book is supplementary: it contains epithets, a list of homonymous words, (arranged alphabetically like many Arabic Dictionaries, according to the final consonants,) particles, and adverbs, (considered as indeclinable nouns by the Hindu grammarians,) and remarks on the gender of substantives. The Sanskrit Dictionaries or *Koshas*, do not include the verbs of the language, the stems or roots being arranged and explained in separate lists. The Amara Kosha contains only about 10,000 different words. In a language so copious as the Sanskrit, this number appears small: but in consequence of the great regularity and consistency with which, in this language, compound nouns and derivatives are formed, very few of these require to be inserted and explained in a Dictionary. Real deficiencies in the list of Amara are supplied partly by commentaries on it, and partly by more recent Dictionaries, one of which, the *Trikandasesha*, by Purushottamadeva, is, what its title implies, purposely compiled as a supplement to the tripartite work of Amara.

An excellent edition of the *Amarakosha*, with marginal explanations and notes in English, and an alphabetic index, was published by Mr. H. T. Colebrooke at Serampore, 1808, 4to.; reprinted, 1829, 8vo. An edition of the mere Sanskrit text, and table of contents likewise in Sanskrit, appeared at Calcutta in 1813, in a volume with three other original Sanskrit vocabularies. (*Asiat. Res.* vii. p. 214, seq. Wilson's *Sanskrit Dictionary*, *Preface*, p. 5. seq. *first edit.*)

AMARANTA'CEÆ, a natural order of apetalous dicotyledonous plants, remarkable for the dry coloured scales of which all their bracteæ and floral envelopes are composed; a character by which they are principally known from Chenopodeæ. Their essential distinction is briefly this: calyx, dry, coloured, not falling away; petals, wanting; stamens, five or more; ovarium, quite simple, superior; fruit, an utricle, containing a single seed, which has an embryo curved round a central farinaceous albumen; leaves, destitute of stipulæ.



[Amaranthus polygamus.]

1. A calyx and bractea with stamens. 2. The same with the pistillum.
3. The pistillum opening. 4. A seed.
5. A seed cut down, showing the embryo. 6. The embryo—all magnified.

The species are found chiefly in tropical countries, where they are often troublesome weeds. The cock's-comb, the globe-amaranth, the prince's-feather, the love-lies-bleeding of our gardens belong to the order; which does not contain a single species in which any deleterious property has been found.

AMARAPURA, a city in the Burman empire, six miles east of Ava, in 21° 55′ N. lat., and 96° 7′ E. long. This city was founded in 1783, by the monarch then on the Burmese throne, and was declared the capital of the empire. The seat of government has since been removed, or rather has returned, to Ava.

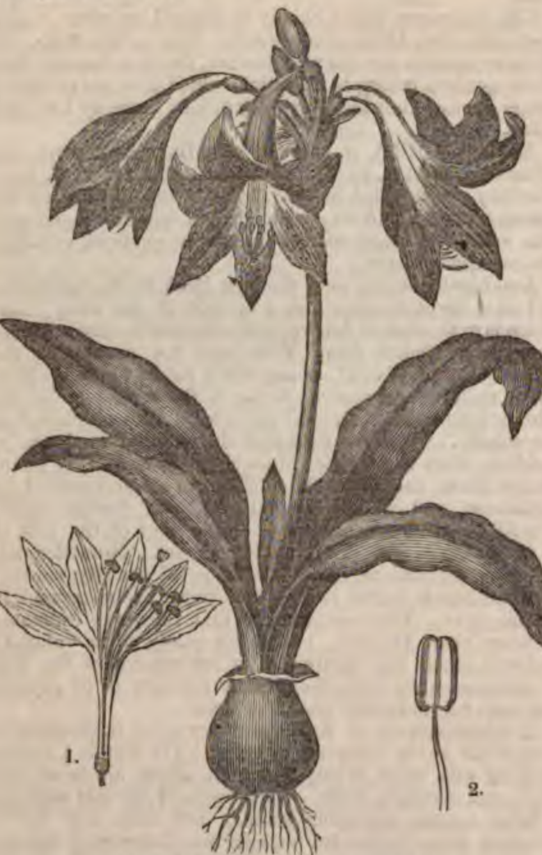
Amarapura stands near the east bank of the Irawaddy, and at a short distance from a branch of the same river, which is to the east of Amarapura, and joins the main stream immediately below Ava. With very few exceptions, the houses are built of wood: many of the public buildings have a very striking appearance, owing to the splendour of the gilding with which their roofs are covered, both within and on the outside. From the nature of the material employed in building, there is great risk of accidents from fire. To guard against these, the better kind of houses are surrounded by enclosures, and all are covered with tiles; besides which, pots filled with water are placed on the ridge of the roof, to be in readiness if a fire should break out. Notwithstanding these precautions, nearly the whole of the city, consisting of 20,000 to 25,000 houses, was burnt to the ground, in March, 1810. The population at that time was estimated at more than 170,000; but owing partly to the calamity just mentioned, and partly also to the removal of the seat of government in 1819, the present estimate of its population does not go beyond 30,000 persons.

The fortifications of Amarapura are equal in strength to most of the native fortresses in India. The fort is a square building with walls twenty feet high, which are faced with brick, and strongly built. Each angle of the fort contains a large square projecting bastion, and each side has a principal gate, besides two smaller ones between it and the bastions, so that there are in all twelve gates. Each side of the fort is somewhat more than 7000 feet long, and the whole is surrounded by a broad ditch, faced with brick. The fort is built on the northern bank of the lake, the waters of which wash its walls whenever the lake is swelled during the rainy season.

The manufacture of jewellery was formerly carried on extensively in this city, an entire street having been filled with the houses of goldsmiths; most of these shops have now disappeared. The fort contains a royal library, the books composing which are contained in about one hundred large, well-filled wooden chests. The river Irawaddy offers the advantage of water-carriage to and from the city, which is situated near a fertile district, where abundance of wheat is raised of a good quality. (Captain Cox's *Notes on the Burman Empire.*—See also Berghaus' *Asia*, and his *Atlas.*)

AMARYLLI'DEÆ, or the narcissus tribe of plants, is a group of monocotyledonous genera, to which the daffodil, the belladonna and Guernsey lilies, and the showy Brunsvigias and blood-flowers (*hæmanthus*) of the Cape of Good Hope belong. They are characterized by having six stamens, a highly-coloured flower, and an inferior ovarium. The beauty of their blossoms serves as a cloak to their poisonous properties, and shows how little the external appearances of plants are to be trusted in judging of their virtues. To form an opinion only from their aspect, these would be pronounced the most harmless of plants, while in fact their bulbs are dangerous poisons; the juice of that of *hæmanthus toxicarius* is inspissated by the Hottentots, who smear their arrow-heads with it; other kinds are not less fatal, and even the common daffodil contains within its bulbs an acrid irritating principle which renders it a powerful emetic. Like many other poisonous families, this occasionally secretes a kind of fœcula, or flour, which, when separated from the juice that is naturally mixed with it, becomes a wholesome article of food; the arrow-root of Chili is yielded by an *alströmeria*, which belongs to amaryllideæ.

The species, which are chiefly scattered over Brazil, Africa, and tropical Asia, are nearly all bulbous; a few only acquire a high degree of development and lose their bulbous character, as the doryanthes of New Holland. No tribe is more admired by cultivators, in consequence of the universal beauty of its flowers.



[Amaryllis reticulata, diminished in size.]
1. The flower cut open. 2. A stamen the natural size.

AMASIEH or **AMASIA**, a sanjak of Anatolia, and also the name of the principal town of the province, which is in 40° 28′ N. lat., 36° 26′ E. long. Amasieh was the birthplace of the Greek geographer Strabo, whose description of its situation corresponds, as far as we can understand it, with the modern appearance of the place. Its antient name of Amasia or Amaseia can scarcely be said to have undergone any change at all. 'My city,' says Strabo (*Casaub.*, p. 561), 'stands in a deep and extensive gorge, through which the Iris (now the Jeshil-Ermak) flows. It is surprisingly favoured both by nature and art, being at once both a town and a garrison: a rock, lofty and precipitous, all round, descends with rapid slope to the river; one part has a wall close on the bank of the stream, where it joins on to the city; and in another part the wall runs up on each side of the hill to the summits, of which there are two, connected with one another and exceedingly well fortified. Within the enclosure made by the wall are the palace and the tombs of the kings. The summits are united by a very narrow neck, the ascent to which is five or six stadia on each side from the bank of the river and from the suburbs; and from the neck to the two summits is about another stadium of steep ascent, which is altogether impregnable. * * * On the tops also water is carried up under the rock; two narrow galleries (pipes, channels, σύριγγες) being cut, one from the neck to the river, and the other from the summits to the neck. * * * There are two bridges on the river, one from the city to the suburbs, and another from the suburbs to the country; at this latter bridge terminates the mountain which overhangs the rock.' The town was of course on both sides of the river: the castle with part of the surrounding walls still exists on the opposite side of the river to the town. The description of Strabo is not altogether intelligible without a better plan of the place than we can find. A view of the mountain with the two tops may be seen in Jackson's *Journey from India* (London, 1799, p. 212.) Jackson describes some of the mountains round the town as being almost half a mile in perpendicular height. They are all calcareous stone, susceptible of a polish. Otter (ii. p. 334) also describes a long road cut with infinite pains in the rock, to bring, as he says, water from the mountains to Amasia; but this is not Strabo's channel. This city is now large and populous: the houses are chiefly of wood, but many are of stone, and are all covered with tiles. There is a large stone mosque, built by Sultan Bayazid, with two lofty minarets, also of stone; the dome of the mosque is covered with lead.

This town can only be approached by two narrow passes, one on the north, the other on the south, both of which can be defended by a small force. The river, which runs in a deep, narrow channel, both above and below the town, is not suitable for navigation. The inhabitants procure from it their chief supply of water, which is raised by wheels furnished with buckets, and driven by the stream. Fontannier calls the river of Amasia the *Tocatlu-sou*, or river of Tocat, and gives the name of Jeshil-Ermak to the lower course of the stream. In the numerous gardens about the town many fine fruits are grown, especially grapes, of which a strong wine resembling sherry is made. Silk forms the chief part of the commerce of Amasieh. There is also a great trade in the fur of the marten, which is caught in the Janik mountains, that extend from Amasieh to Trebisond. Many of the inhabitants are Christians, but the population is not known. Amasieh has an Armenian archbishop. Fontannier, a late traveller, states the number of houses at 10,000.

The antiquities of Amasieh are often spoken of, but no satisfactory account of its remains is yet published. Jackson describes some holes in one of the hills cut in the solid rock (see his plate) similar to a Hindoo pagoda, which can only be approached by narrow passes cut through the rock. (Compare Morier, *Journey through Persia*, &c., p. 349.) The ruins of a temple also are mentioned by Fontannier.

We are not able fully to understand the passage from Strabo placed within asterisks; it either means that there was a communication under the surface, between the river and the castle, and the two summits, for the purpose of securing a supply of water from the river, or that the channels conveyed water from a spring on the summit to the town: but it is impossible to say what is the precise meaning of Strabo. The two existing canals, which Fontannier speaks of as the canals or pipes (σύριγγες) of Strabo, are certainly not those described by the Greek geographer. No modern traveller has yet given any such account as will at all explain this obscure passage of Strabo. The name is written Amasseia on the earlier coins, and Amasia on those struck under the early Roman emperors. (See Rasche, *Lexicon Rei Numariæ*.)

AMA′SIS, or **AMO′SIS**, the eighth king, according to Africanus, of the twenty-sixth dynasty of Egyptian kings, reigned from B.C. 569 to B.C. 525. Amasis was a native of Siouph, in the nomos (district) of Sais, in the Delta. Being sent by Apries (the Pharaoh Hophra of Scripture, Jerem. xliv. 30.) to stop a mutiny in the Egyptian army, he was proclaimed king by the rebels, and returning at the head of this army, he defeated his master, who was supported by a force of 30,000 Carians and Ionian Greeks. After the battle, Amasis became king of Egypt, and Apries, being surrendered to the Egyptians, was put to death.

Amasis married a Greek wife from Cyrene, and further prepared the way for great changes in the social condition of Egypt, by allowing Greek merchants to settle at Naucratis, and to build temples and bazaars. Solon is said to have visited Egypt in his reign. Amasis decorated Sais, the chief city of the nomos, in which he was born, with numerous great works of Egyptian art: these were, magnificent propylæa to the temple of Athenæa; enormous colossi; and large androsphinxes. But his great architectural achievement was a monolith (one-stone) temple which he brought from the granite quarries of Syene, down the river, a distance of about 600 miles. The exterior dimensions of this stone were 31½ Greek feet long, 21 broad, and 12 high: a chamber was cut out in the interior, the dimensions of which were 28¼ feet long, 18 broad, and 7½ high. (See *British Museum. Egypt.*) Sais, the royal residence of Amasis, where so many wonders of Egyptian art were collected, is now a mass of rubbish called Sa el Hajar, or Sa, *the Rock*; exhibiting only mounds of rubbish and pottery, and sun-dried bricks. Many remains of antiquity might probably be discovered by digging.

Amasis also made a colossus 75 Greek feet long, flanked by two smaller figures 30 feet high, which he placed in front of the great temple of Hephæstus (Phtha) at Memphis. He placed another at Sais, of the same size. He was succeeded by his son Psammenitus, who was conquered by Cambyses the Persian, B.C. 525. (See *Description de l'Egypte. Antiq.*, vol. v. Herod., book ii. chaps. 162—182.)

AMATHO'NTE, a small village of Cyprus, on the south coast of the island, near the sea, said to be on or near the site of the Greek city of Amathus, and a few miles from the modern Limassol. Amathus was a city of great antiquity, and possibly of remote Phœnician origin, though afterwards inhabited chiefly by Greeks. Adonis was worshipped there in a temple of great antiquity. [See ADONIS.] In the neighbourhood were mines of metal. Near Limassol there are still considerable remains, supposed to belong to the old town. (See Mannert, *Syrien*, p. 447.)

AMA'TI, HIERO'NYMUS, the name of a celebrated maker of violins, a native of Cremona in Italy, who lived about the year 1600. His son, Anthony, and his grandson, Nicholas, (son of the latter,) were also excellent makers.

AMA'TO, or AMATUS, (JOANNES RODERICUS) often called Amatus Lusitanus, a very eminent physician of the sixteenth century. Most of the particulars that are known of his personal history are in his writings, from which they have been carefully collected by Astruc, in his treatise *De Morbis Venereis*. (See vol. ii. pp. 735—740, 2nd edit. 4to., Paris, 1740.) Succeeding biographers have copied the statements in Astruc's notice, but not in all respects with accuracy. Amato was of a Jewish family, and was born at Castel-Branco, in the province of Beira, in Portugal, in 1511. Like many of his nation, concealing his religious faith, he was educated at Salamanca; after leaving which, he travelled in France, the Netherlands, Germany, and Italy. He remained for some time both at Venice and Ferrara, giving lectures on the medical art; and, as Astruc adds, putting the statement in Italics, he superintended the dissection of twelve bodies in the year 1457. But it is evident that this date is a mistake, and that the year should probably be 1547, a correction which may perhaps make the circumstance recorded not quite so remarkable. Before 1549, Amato had removed to Ancona, where he resided and practised his profession till 1555. While here, he had the honour of being several times called to Rome to attend the Pope, Julius III. Dread of the Inquisition, however, whose notice had been attracted to him as a concealed Jew, induced him, in 1555, to withdraw to Pesaro. It appears that on this occasion he found an enemy in the new pope, Paul IV., and that in his precipitate flight he left behind him all his property, and lost the manuscript of an unfinished commentary on *Avicenna*, which he was preparing for the press. From Pesaro he some time after retired to Ragusa, and from thence, in 1559, to Thessalonica (Saloniki), where he made open profession of the religion of his forefathers. He is ascertained to have been alive in 1561, but no notice of him occurs after that date, and it is not known when he died. Amato is the author of two works, both of which long ranked among the most esteemed medical treatises of modern times. The one is entitled, in the first edition, printed in 4to. at Antwerp, in 1536, *Exegemata in Priores duos Dioscoridis de Materia Medica Libros*; and in subsequent editions, *Enarrationes in Dioscoridem*. It was printed with this title in 4to. at Strasburg, in 1551, and in 8vo. at Venice, in 1553, at Strasburg in 1554, and at Lyons in 1557 and 1558; the last two editions have notes by Robert Constantine. Amato's other work is his *Curationum Medicinalium Centuriæ Septem*. Of this work, the first part or century, written at Ancona, in 1549, was published in 8vo. at Florence, in 1551; the second, written at Rome, in 1551, was published in 12mo. at Venice, in 1552; the third and fourth, written at Ancona, in 1552 and 1553, were, probably after having been printed separately in Italy, published together, and accompanied by the preceding two, in folio, at Basil, in 1556: the fifth, written at Pesaro and Ragusa, in 1556 and 1557, the sixth, written at Ragusa, in 1558, and the seventh, written at Thessalonica, in 1561, were published together at Venice, in 1566. The author intended to complete the work by the addition of three other centuries, in which, and not, as has been commonly said, in a complete edition of Dioscorides, he proposed to make his reply to an attack that had been directed against him by Peter Andrew Mathiolus, in a treatise entitled *Apologia adversus Amatum*, published in folio at Venice, in 1557. This design, however, he appears not to have lived to accomplish. Besides other reprints of portions of the work, the collected Centuries of Amatus appeared in 12mo. at Lyons, in 1580; in 4to. at Paris in 1613, and in 1620; in 4to. at Bordeaux, in 1620; and in folio at Frankfort, in 1646. In both these works, the author is said to show an intimate acquaintance with the writings of the Greek and Arabic physicians; and they are also stated to contain many curious notices both in medicine and in natural history. Some of his biographers mention a translation into Spanish by Amato of the *Roman History* of Eutropius.

AMAURO'SIS, from *ἀμαυρόω*, (to darken or to make obscure,) dimness of sight, blindness. [See GUTTA SERENA.]

AMAZI'AH, or AMAZIAHU, means literally, *one strengthened by Jehovah*, and is the name of the ninth King of Judah, who began to reign when he was twenty-five years old, about the year 838 B.C., after his father Joash had been murdered in the house of Millo by his own servants Jozachar and Jehozabat. (2 Kings xiv.) Amaziah reigned twenty-five years in Jerusalem; his mother's name was Jehoaddan of Jerusalem. He did what was right in the sight of the Lord, yet not with a perfect heart, and not like David; he did according to all things as Joash his father did. The people in his reign still sacrificed, and burnt incense on the high places. He slew his servants who had slain the king his father, but the children of the murderers he spared. Having resolved to attack the Amalekites, Idumæans, and Gabilitans, he collected an army of 300,000 men in the tribes of Judah and Benjamin, and paid 100 talents of silver to 100,000 auxiliaries of the kingdom of Israel, but according to the advice of a prophet, he dismissed the auxiliaries before the war commenced. The disbanded Israelites upon this ravaged the cities of Judah, slew 3000 men, and took much spoil. With his own troops, Amaziah slew 10,000 of the Edomites in the Valley of Salt, and the children of Judah brought other 10,000 of the Edomites to the top of a rock, and cast them all down. Amaziah also took *Selah* and called it *Joktheel*. The name of Selah is translated *Petra, rock*, by the Greeks. The remains at this place in Arabia Petræa, between the *Dead Sea* and the Elanitic Gulph, are described by Irby and Mangles (*Travels*, p. 336, &c.)

Amaziah, flushed with the victory over Edom, set the gods of Seir up to be his gods, burned incense unto them, and declared war against Jehoash, the King of Israel. But Judah was worsted before Israel, and they fled every man to their tents. Jehoash took Amaziah captive at Beth-shemesh, and broke down of the wall of Jerusalem, from the gate of Ephraim unto the Corner-gate, four hundred cubits. He also took all the vessels that were found in the house of the Lord, and in the treasures of the king's house, and hostages, and returned to Samaria. It appears that Amaziah obtained his liberty, for we know that he reigned after the death of Jehoash fifteen years, until they made a conspiracy against him in Jerusalem; and he fled to Lachish; but they sent after him and slew him there, and brought him on horses, and buried him in Jerusalem with his fathers in the City of David. And the people of Judah took *Azariah*, (*Help of Jehovah*,) or *Uzziah*, (*Power of Jehovah*,) who was sixteen years old, and made him king instead of his father Amaziah, 2 Kings xiv.; 2 Chron. xxv.; Compare Jos. *Ant.* ix. 9, 10. The Septuagint wrote for *Amaziah*, Αμεσσίας, Josephus, *Αμασίας*, and the Vulgate *Amasias*.

A'MAZON, or MARAÑON, or ORELLA'NA, is the name given to a river which traverses the equatorial regions of South America nearly in its whole extent, running chiefly from west to east, and having its embouchure almost under the equator. It is the largest river on the globe, not only for the length of its course, but also for the extent of country which is watered by this noble stream, and its great tributaries.

Geographers do not agree as to the true sources of this river, though they agree in placing them in the highest ranges of the Cordilleras. Some think that they are found in an alpine lake, a little to the south of the tenth parallel, called the lake of *Lauricoche*. From this lake a river issues which is called the *Upper Marañon*, or *Tunguragua*, and runs north-north-west in a longitudinal valley of the Cordilleras, up to about 5° of southern lat., or 350 miles. The direction of its course is then changed to the north-east for about 50 or 60 miles, and in this part of its course the river descends from the high valley of the mountains to the plains that are situated to the east of them, by the *Pongo de Manseriche*, which name is given to a long rapid of the river, full of eddies and small cataracts, extending between the town of *St. Jaen de Brancamoros*, and the village of *Chuchunga*, for about twenty-four miles. The river above the Pongo runs down the mountain channel, forming rapids and cataracts, but increased to the width of 250 fathoms; below St. Jaen de Brancamoros it suddenly contracts to 25 fathoms, and rushes through a rent or crevice between mountains of tremendous height. This Pongo cannot be descended in boats, because they would be broken to pieces by the shocks which they experience when dashed against the rocks. Balsas, therefore, are used, a kind of rafts, made of a very light wood or rather cane, similar to the bamboo, the single pieces of which are fastened together by rushes in such a manner that they yield to every shock of moderate violence, and consequently are not subject to be separated even by the strongest. The rafts used in the surf of Coromandel in the East Indies, and called there catamorans, are constructed on the same principle. At some distance from the Pongo, the Tunguragua leaves the mountains and enters the plain. Here it receives first from the right the *Huallaga* or *Guallaga*, a river whose sources are somewhat to the south of the principal stream, and which, traversing another but lower longitudinal valley of the Cordilleras, runs almost parallel to the Tunguragua, nearly due north, for about 350 miles.

Advancing farther to the east, between the 4th and 5th degree of southern lat., the waters of the river are increased by two great tributaries from the left, the rivers *Pastaza* and *Tigre*, both of which rise in the Cordilleras, between 1° and 2° of southern latitude, and descend in a south-eastern course to the Tunguragua. The course of the former is stated to be about 350, that of the latter nearly 400 miles.

Thus increased by the waters of three large rivers, the Tunguragua meets at *St. Joaquin de Omaguas*, its rival, the *Ucayali*, which is considered as the true source of the Marañon by all those who think that the stream which rises farthest from the mouth has the best claim to the honour of being thought its source. Yet the sources of the Ucayali are not known. It was formerly conjectured that the principal source of this river was the *Beni* or *Paro*, which was supposed to be formed by the waters descending from the Cordilleras about the 18th southern parallel, and somewhat to the north of it. But Lieutenant Mawe, in his *Journal of a Passage from the Pacific to the Atlantic, &c.*, has translated a few notices respecting the sources of the Ucayali, which were published at the time of his stay in Peru, according to which, the river *Paroheni* rises not far from the town of Cuzco, probably near the 14th southern parallel. This agrees very well with the statement of Mr. Pentland, who ascertained that the high snow-topped range, which borders on the east the valley of the lake of *Titicaca*, extends much farther to the east, and occupies the site where our maps place the sources of the Beni or Paro. It seems, therefore, very probable, that the waters descending from that range run directly to the *Mamoré*, a tributary of the Madeira. The Parobeni then would not be the most southern source of the Ucayali, but we must look for it in the *Apurimac*, which rises to the north-west of the lake of Titicaca, between the 15th and 16th parallel, and runs in a longitudinal valley north and north-north-east for more than 3° of lat., till at about the 12th southern parallel it meets the river *Jaura*, descending from the north in the same longitudinal valley. After its junction with this river, the Apurimac turns to the east, and enters the plain, where it mingles its waters with those of the *Pangoa*, descending from the Cordilleras on the east, and takes the name of *Tambo*. At 10° 31′ of southern lat., the Tambo unites with the Parobeni, whose course has been nearly due north through nearly 4° of lat., and the river formed by their conjunction is called Ucayali. The Ucayali continues its course in the direction of north-north-east for 6½° of lat. till it reaches St. Joaquin de Omaguas, and joins the Tunguragua. Both rivers unite, and are called afterwards *Amazon*, or *Marañon*.

From the town of St. Joaquin de Omaguas, the Amazon traverses 22° of longitude, running nearly in an eastern direction. In all this extent it traverses only 4° of latitude, from the 4th parallel to the equator; and two of them it traverses near its embouchure, where it runs nearly north-east. In this part of its course it receives a great number of tributaries, some of them of such magnitude, as to surpass the largest rivers in Europe in their extent and the volume of their water.

From the north, there fall into the Amazon, the *Napo*, the *Putumayo*, the *Yapura*, and the *Rio Negro*. All these four rivers rise in the eastern declivity of the Cordilleras, within a space not exceeding 3° of long. (between 75° and 78°) and 3° of lat. (from 1° of southern lat. to 2° of northern), but as they meet the Amazon river at great distances from one another, the courses of those which join the main stream farthest to the east, are the longest. The Napo, the most westerly and shortest of them, has its source at the foot of the volcano *Cotopaxi*, and runs first nearly due east, afterwards east-south-east till it reaches the Amazon river, after a course of between 700 and 800 miles. The Putumayo, which is also called *Ica*, rises on the eastern declivity of the snowy mountains, which inclose the high valley of Pasto on the east, about one degree to the north of the equator, and runs parallel to the Napo; but towards its mouth its course, for a considerable space, is directed towards the east, parallel to the Amazon river itself. The whole course of this river is reckoned to amount to upwards of 800 miles. The Yapura, or *Caqueta*, rises where (between 1° and 2° of northern lat.) the chain of the Cordilleras divides into three great branches, not far from the sources of the *Magdalena river*, and runs parallel to the Putumayo, but reaches the Amazon much more to the east, after a course of about 900 miles. The Rio Negro is by far the largest of the northern tributaries of the Amazon river. Its unknown source lies about the 2nd parallel of northern latitude, and the 75th meridian west from Greenwich. Its upper course, for 7° of long., (from 75° to 68°) is nearly due east, up to the place where the *Cassiquiari* branches off to the north-north-east, to form a connexion between the Rio Negro and the Orinoco. At this point the Rio Negro changes its course to the south, and continues in this direction for 2° of latitude, till it has passed the equator, where it unites with the *Guapes*, a river which likewise descends from the eastern declivity of the Cordilleras, and at its junction with the Rio Negro has already run upwards of 500 miles. This river forces the Rio Negro to resume its eastern direction, in which it continues for 5° more of longitude, at a distance of about 20′ to the south of the equator. It then gradually begins to approach the Amazon river by an east-south-eastern course, and here it receives another great tributary, the *Rio Branco*. This river rises in the mountains called *Pacarayma*, a ridge of the mountain-mass called by Humboldt *Parime*, and not far from the sources of the *Paragua*, a tributary of the *Caroni*, which falls into the Orinoco, running to the north. The upper part of the course of the Rio Branco is nearly parallel to the ridge, from west to east, for upwards of a hundred miles, till it suddenly turns to the south, and reaches the Rio Negro by a south-south-western course. Its whole course probably amounts to at least 500 miles. After this junction, the Rio Negro declines entirely to the south-east, and reaches the Amazon river at about the 60th meridian. The whole course of the Rio Negro cannot be less than 1400 miles, and this tributary of the Amazon river may well be compared with the Mississippi before its junction with the Missouri.

To the east of the Rio Negro, a few other rivers fall into the Amazon on the north side. They rise in the mountains of French Guiana, but have a comparatively short course, and as none of them have acquired any political importance, we omit them here, and turn to the streams which bring their tribute from the south to this king of rivers.

After the junction of the Ucayali with the Tunguragua, the Amazon receives from the south the following tributaries, the *Yavari*, the *Yutai*, the *Yurua*, the *Tefe*, the *Purus*, the *Madeira*, the *Topayos*, and the *Xingu*. The Yavari is comparatively a small river, for its whole course, as it seems, does not extend over more than 4° of lat. in a north-eastern direction, so that it can hardly exceed 360 miles; but it is mentioned for its political importance, as forming the boundaries between Brazil and the republic of Peru. The rivers Yutai, Yurua, Tefe, and Purus, are thought to have their sources much farther to the south, about the parallel of the town of Cuzco, and the two former, or, according to some maps, three of them, are said to issue from a vast lake, called *Roguaguado*, but these statements depend on the accounts collected by some missionaries from the information of the natives. The course of these rivers lies through the least known part of South America, as they have never been ascended nor descended by any European, as far as we know, and the statements of the natives are not much to be relied on when they refer to such great distances. All the country between the rivers *Parobeni* and *Purus* may be considered as unknown.

The *Madeira*, however, the largest of the tributaries of the Amazon river, is pretty well known, because it has been ascended even in its upper branches. Two large rivers are considered as its sources, the *Mamoré* and the *Guaporé*, but they descend from different places; the former is the channel for the waters that run down to the east from the high ground between the 14th and 20th degrees of latitude; the latter collects chiefly those that descend from the Campos Pareceis in Brasil. The most southern source of the Mamoré is on the south of the mountain mass near *Santa Cruz de la Serra*, a branch or offset of the Cordilleras projecting some distance to the east. Here the river formed by the waters descending from the north and west, is called *Condorillo*, and runs for above three degrees of longitude to the east-south-east along the foot of the mountains: before it reaches the plain of *Chiquitos*, which separates the Cordilleras from the Campos Pareceis, and turns to the north, the name of Condorillo is changed to that of *Rio Grande* or *Guapihi*. Running in the plain it surrounds the western extremity of the *Sierra de Santa Cruz*, returning from the 64th meridian to the 66th. It then takes the name of *Mamoré*, and runs to the north and north-east till it reaches the *Guaporé*, or *Itenez*, the other branch of the Madeira. The Guaporé, which has its source more to the east, and in about 16° S. lat., is increased by many considerable rivers, especially the *Ubay*, which joins it from the south-east. Its general course lies to the north-north-west, and only where it approaches the Mamoré, it runs nearly due north-west. At about the 12th degree of lat., both rivers uniting, take the name of Madeira (the Portuguese name for wood), because its banks are covered with high forest-trees. Between 12° and 9° of southern lat. the Madeira runs nearly due north, but then declines considerably to the east, till it reaches the Amazon river at 3° 24′ 18″ of southern latitude, and about 59° west from Greenwich. Though the course of this river is obstructed by some rapids and falls, it is navigable almost in its whole extent. The whole course of the Madeira from the sources of the Condorillo amounts to upwards of 1800 miles.

The Topayos or Topayoso, its neighbour to the east, rises in about 14° of southern lat., and runs generally to the north-east, till it reaches the Amazon between 1° and 2° of southern lat. and 54° and 55° of western long. Its tributaries are numerous, especially in the upper part of its course, but not considerable. Its whole length may amount to 900 miles. The last great tributary of the Marañon is the Xingu, which rises in the interior mountainous parts of Brasil, about 15° of southern lat., and runs for a great part of its course to the north-north-west, approaching the Topayos; it then runs parallel to it, but at some distance before its junction with the main stream it makes a great bend to the south-east, and then joins, with a north-north-eastern course, the Amazon. Its whole course amounts to about 1000 miles.

Towards its embouchure the Amazon divides into two branches, of which the northern is by far the broadest, and retains its name. The southern, called *Tagypura*, runs south of the island called by the Portuguese *Ilha dos Ioanes*, or *Ilha do Marajò*, and joins on the eastern side of the island the river Tocantins, which after this junction is called the river *Para*. The width of the channel between the island and the continent is about eighteen miles, but towards its mouth it widens to thirty miles.

The *width* of the Amazon river is, of course, various. In the upper parts of its course it averages from one to two miles; but lower down it grows much wider, and after its junction with the Xingu it is hardly possible to discover its opposite banks.

From the sea to the mouth of the Rio Negro the depth of the main channel is nowhere less than thirty fathoms; higher up it varies from ten to twelve; and up to the basin of Omaguas, near the junction of the Tunguragua with the Ucayali, there is depth of water for vessels of almost every description. Higher up, only vessels can proceed with safety which do not draw more than five or six feet water. Such vessels may enter the Tunguragua and proceed up to the Pongo of Manseriche. The Guallaga and Ucayali too are navigable for such vessels to a considerable distance from their junction with the main stream.

The shoals of the river are very numerous; and the navigable channels in many places narrow, winding, and subject to continual changes. The banks of the river being low are subject to be under water, owing to the freshets and great swellings in the rainy season: when they happen, the country is inundated for many miles on each side of the river, the whole of the numerous islands are covered with water, and often either change their situation, or new ones are formed. In the lower part of its course, the navigation is rendered somewhat difficult by the floating trees, which descend from the Madeira, as into the Mississippi from the Missouri.

The islands formed by this river are almost innumerable, and of all sizes; many are twelve or fifteen miles in circumference, and some thirty or thirty-six. The most remarkable are the islands of *Tupinambas*, of dos Ioanes, and of *Caviana*. The first is properly formed by the two branches by which the Madeira joins the Amazon; that to the east, running parallel to the main land, is named *Manes*, and separates the island of Tupinambas from the Amazon. The island itself extends over two degrees and a half of longitude according to the statement of Lieut. Maw, but it seems to be very narrow. The Ilha dos Ioanes, or Ilha do Marajò, which, as we have already noticed, is enclosed by the two branches of the Amazon and the river Para, extends from east to west about 130 miles, and not much less from north to south: its circumference is stated to be from 500 to 600 miles. The island of Caviana, which lies where the river meets the Atlantic Ocean, is about 40 miles in length, and nearly 25 in breadth; it is said to be very fertile.

The rapidity of the stream is very great; according to Lieut. Maw, its common rate is about four miles per hour, in some places more, and in some less. That, however, is only the case in the rainy season, between April and October; in the dry season its rapidity is diminished. The tide which enters the river may be observed as far as the town of Obidos, 400 miles from its mouth. When the tide begins to ebb, and the sea-water receding liberates the imprisoned current of the river, the Amazon pours out with increased force and velocity into the ocean, and as it here meets, at no great distance from the land, the current which from cape *St. Roque* runs along the north-eastern coast of Brasil, it gives rise to that phenomenon which is called by the Indians *Pororoca*. The river and the current, having both great rapidity, and meeting nearly at right angles, come into contact with great violence, and raise a mountain of water to the height of 180 feet, as it is, perhaps rather extravagantly, estimated. The shock of these two bodies of water is so dreadful, that it makes all the neighbouring islands tremble, and fishermen and navigators fly from it in the utmost terror. It may be said, that the river and the ocean contend for the empire of the waves. But they seem to come to a compromise: for the sea-current continues its way along the coast of Guyana to the island of Trinidad, and the current of the river is still observable in the ocean at a distance of 500 sea-miles from its mouth, according to the statement of Sir James Yeo. (See Major Rennell's *Investigation of the Currents of the Atlantic Ocean.*)

According to the calculation of Baron Humboldt, the whole course of the Amazon river amounts to 720 German geographical miles, (at 15 to a degree,) or upwards of 3300 English statute miles; but he considers the Lake of Lauricoche and the river Tunguragua as the true sources of the river. If the Apurimac is taken as the main stream instead of the Tunguragua, the course of it will be increased by 300 or 400 miles.

The last-mentioned traveller discovered and navigated the natural canal by which the river-system of the Amazon is united to that of the Orinoco. Some vague information of the existence of such a connexion had already before his time reached Europe, but it was strongly combated by geographers, and rejected. Now, however, it is no longer doubtful that a river, called the Cassiquiari, forms between the 2° and the 3° of northern latitude a navigable connexion between the Rio Negro and the Orinoco, running about a hundred miles and upwards in a north-eastern direction. The country on its banks is nearly uninhabited.

Humboldt considers the country on the banks of the Amazon and between the lower courses of its tributaries as a plain, but it does not deserve such a name, when compared with the Llanos of the Orinoco and the Pampas of the Rio de la Plata. The country immediately on the banks of the Amazon, and also to a distance of many miles on each side, is very low, and therefore subject to be inundated, but farther from the banks it rises and is much diversified with low hills covered with tall trees. The full growth of these trees, the hardness of their wood, which often defies the attacks of iron and even the finest steel, and their vigour of vegetation, give unequivocal testimony to the richness of the soil on which they grow, and would, perhaps, a hundredfold repay the labour bestowed on it, if it was cultivated. But it is almost entirely without culture, and, except a few spots where the Spaniards and Portuguese have settled, it is only inhabited by the native savages, who roam about in the immense forests and live by hunting. Very few articles are brought thence to the markets of the world, and those are only gathered from the wild trees and plants, as cacao, sarsaparilla, copaiba-gum, and caoutchouc. Doubtless these immense forests with their vigorous vegetation conceal many valuable treasures; but until our times access to them was shut up from political motives, and the time which has elapsed since has not been sufficient to examine such a vast field with any degree of attention and success.

The fish of the Amazon river itself are not much better known. Turtles of different kinds are in great abundance; alligators are frequently met with, but the most extraordinary animal is the manatee (*Trichecus Manati*), which is also called the sea-cow, though according to Baron Humboldt it is never met with in salt-water. It is found also in the Essequibo. [See MANATEE.]

It is observed as a very curious fact, that between San Francesco de Borja (4° 28′ S. lat. and 76° 24′ W. long.) and the mouth of the Rio Negro, a stone or a pebble is almost as rare as a diamond.

The first European who descended this river was *Francisco Orellana*, a Spaniard, and to preserve the memory of his bold enterprise, the river is called by many Spaniards *Orellana*. This adventurer narrated, that its banks were inhabited by warlike nations; and that in some parts the women themselves went into battle, which gave rise to the name of *Amazon*, in reference to the ancient fable of the Amazons. It is uncertain whence the name of *Marañon* is derived. The most probable conjecture is, that a nation of this name inhabited a part of its banks.

Both the Spaniards and the Portuguese have erected some settlements on its banks, but they are of little importance. St. Jacn de Brancomoros on the Tunguragua is the most important settlement of the Spaniards, containing about 4000 inhabitants; St. Francisco de Borja, at the confluence of the Amazon and Pastaza, is much smaller. The most remarkable settlements of the Portuguese are Obidos, where an excellent sort of cacao is gathered, and Santarem, at the mouth of the Topayos. Both contain only a few thousand inhabitants.

The effects of civilization cannot be better shown than by a reference to the state of navigation on the Amazon and its rival rivers the Mississippi and Yantse-Kiang. Though the country traversed by the river-system of the Amazon is more extensive than those which belong to the two latter, and perhaps not inferior in fertility, the number of vessels that navigate the Amazon river all the year round is certainly less than those that pass in one month along the Mississippi, and probably not greater than the number of those which every day ascend and descend the Yantse-Kiang. (See *Travels* of La Condamine, of Baron Alexander von Humboldt, and of Lieut. Maw; Southey's *History of Brasil;* the Atlas to Humboldt's *Travels;* Arrowsmith's *Map of America;* and *Journ. of Lond. Geog. Soc.*, vol. ii. p. 650.)

A'MAZONS, a fabulous nation of female warriors. Still it is remarkable, that, wild and almost impossible as the stories relating to them for the most part are, the historians and geographers of antiquity bear strong testimony to the general belief that such a nation existed. All appear to agree in assigning them a Scythian origin. Two Scythian princes, according to Justin, wandering from their own country, reached the river Thermodon in Cappadocia with their followers, and settled there. The new comers in time provoked the anger of their neighbours, and, in a war which ensued, their male population was almost exterminated. The women then took up arms, and with so much better success, that in future they resolved to live without men, and put the remaining males to death. They elected two queens, who in turn commanded their armies in the field, and kept order at home. They are said to have extended their conquests far and near, and to have founded many cities in Asia Minor, as Ephesus, Smyrna, Cumæ, and others: and indeed they are placed by different authors in so many different parts of Asia Minor, that nothing certain can be made out respecting them. Their chief seat, however, was Themiscyra, on the river Thermodon, near the southern coast of the Euxine sea. Diodorus places a tribe of Amazons in Libya; far more ancient, he says, than those settled on the Thermodon. The names of Antiope, Hippolyta, (whose tomb was shown at Megara in the time of Pausanias,) Penthesilea, Thalestris, will be familiar to the student of Greek and Latin poetry. The Amazons are said to have been warred on by Heracles (Hercules) and by Dionysus (Bacchus); to have invaded Attica in the time of Theseus, under the command of Hippolyta; and the battle between the Amazons and Athenians was painted at Athens in the celebrated portico called Pœcile (the painted). Priam fought for the Trojans against the Amazons after the death of Hector; yet the Amazons came to the assistance of the Trojans against the Greeks under the command of Penthesilea, who was slain by Achilles, (Virgil, *Æn.* i. 491.) Though they rejected the fellowship of men, they did not neglect the care of continuing their race: but they only brought up female children, whom they educated in all the arts of war, searing the right breast, that it might not interfere with the free use of the arm. They are usually figured, in medallic and other representations, with a short mantle, reaching to the knee, the left breast bare. By the orator Lysias, they are said to have been the first who fought on horseback, and to have had iron weapons, which were not in use among their neighbours. This may, perhaps, have arisen from the geographical position assigned to them, near the country of the Chalybes, or workers in iron. Their weapons were a semicircular, or crescent-shaped shield, bows and arrows, and the double-edged battle-axe, which was their peculiar and distinguishing weapon. Even in times of ascertained and credible history, we still find rumours concerning these singular beings; for it is asserted by Diodorus and Curtius, that Thalestris, Queen of the Amazons, paid a visit to Alexander in Hyrcania; and by Plutarch, that certain Amazons fought with the Albanians against Pompey. The story of the Amazons visiting Alexander is discussed by Arrian, (vii. 13,) with his usual judgment, and exploded: Arrian believes, however, that there was once a race of Amazons. We may here mention that the Amazons are placed by Strabo in the mountains of Albania, on the banks of the Caspian Sea. Of their name two derivations are given: one that they are so called from *ἅμα ζώσας*, 'females living together;' the other as being *ἄνευ μάζου*, 'without a breast.' It is more likely to have been originally a foreign word, which the Greeks, according to their custom, transmuted into a Greek form, and then proceeded to invent a fitting etymology. There are, it is said, figures in India, consisting of half a male, and half a female body, vertically united: and it has been suggested, that something of this kind may have given rise to the story of the Amazons.

The story of a race of Amazons is not confined to Asia. Alvarez, who visited Abyssinia in 1520, speaks of a race of Amazons south of Damot, who were warlike, and fought with bows and arrows, mounted on bullocks. They destroy the left breast when young. They live with their husbands, but are governed only by a queen: the men have nothing to do with war. Pierre Petit has written a long book, (*Traité Historique sur les Amazons*,) to prove that there were Amazons, in which all or most that is reported about them will be found collected. (See also Herod. iv. 110-116. Strabo, Diodorus. Justin.) The figure of an Amazon is a common type on antient coins. (Rasche, *Lexic. Rei Num.*)

AMBASSADOR is the term most commonly used by writers on public law, to designate every kind of diplomatic minister or agent, and may, in this sense, be defined to be a person sent by one sovereign power to another to treat upon affairs of state. The necessity of employing such means of communication between independent communities is so obvious, that there is hardly an instance on record of a people in so rude a state of society, as to be ignorant of the functions of an ambassador, and of the respect which is due to his office. The right of communicating in this manner, the right of embassy as it is called, belongs by the law of nations to the person or persons in whom the sovereignty of an independent state is lodged. In the republics of ancient Greece, and of ancient and modern Italy, ambassadors were often appointed directly by the legislative assemblies: in modern states, however, whatever may be the form of their government, ambassadors are, for the most part, named by the person intrusted with the supreme executive power. In the United States of North America, the President names an ambassador, but the appointment must be confirmed by the Senate. Sometimes, like other matters within the province of the executive sovereignty, the power of appointing and sending ambassadors has been delegated to a subordinate executive officer, as it was to the viceroy of Naples, the Governor of Milan, and the Spanish Governor-General of the Netherlands. It belongs to every power which has the right of making war and peace, and accordingly is possessed by the East India Company. Embassies were antiently sent only on particular occasions, with authority to transact some specific business; as for instance, to negotiate a treaty of peace or alliance, or to complain of wrongs and demand redress. But great necessary changes were gradually introduced, occasioned by the political condition of Europe and modification of society. The several states which had previously risen to importance, although independent of one another, were yet bound together by numerous ties, and with the progress of commerce and civilization, the intercourse between them became so great, and their interests so complicated, that it was found expedient for them to keep up a more regular communication; and with this view it became customary for one power to have its ambassador residing constantly at the court of another.

Among the ordinary functions of an ambassador, the following are the most important; 1st, to conduct negotiations on behalf of his country;—the extent of his authority in this respect is marked and limited by the power which he has received from home; he has, however, by the modern law of nations no authority to conclude any engagement definitively, the treaty which he has negotiated having no binding power, till it has been formally ratified by his government; 2ndly, to watch over the accomplishment of all existing engagements; and 3dly, to take care generally that nothing is done within the territories of the state, nor any treaty entered into with other powers, by which the honour or interests of his country can be affected, without informing his government of such measures.

Besides these more public functions, an ambassador has certain duties to perform towards private individuals of his own nation: such as, to provide them with passports; to present them at court, if they produce the requisite testimonials; to protect them from violence and injustice; and if any manifest wrong has been done, or if justice has been refused them, to exert himself to obtain redress, and to secure for them the full benefit of the laws; and, lastly, to assist them in maintaining their rights in courts of justice, as well by certifying what is the law of his country upon the point in dispute, as by the authentication of private documents, which is usually confined in practice to such as have been previously authenticated at the foreign-office of his own government, and thence transmitted to him.

The right which exists in every sovereign power, of communicating by means of ambassadors, implies on the part of the state to which such communications are made, certain corresponding duties. [See Grotius *on the Law of War and Peace*, Book ii. c. 18.]

The first of which is that of receiving the ambassadors sent to it. This is a duty, however, which exists only between nations at peace with each other; for, in time of war, a hostile power cannot claim to have its ambassadors received, unless they are provided with a safe-conduct or passport; and the granting of these is merely a matter of discretion. And in order to claim the performance of this duty, it is, in all cases, requisite that the ambassador should be provided with the proofs of his authority; these are contained in an instrument, called his Letters of Credence, or Credentials, delivered to him by his own government, and addressed to that of the state to which he is sent. [See CREDENTIALS.] A refusal to receive an ambassador properly accredited, if made without sufficient cause, is considered a gross insult to the power that he represents. But if one of several competitors for the sovereign power in any country, or if a province which has revolted and asserts its independence, claims to send an ambassador, a government, so far from being bound to receive the person so sent, cannot do so without thereby taking upon itself the responsibility of recognizing the competitor in the one case to be actually the sovereign, and the revolted province in the other to be actually independent. Though this may be the general principle, the practice is somewhat different. In such cases, consuls are generally first sent; and when a *de facto* power has been established for some time, governments think themselves justified in following up these consuls by ministers, even though the mother country, to which the revolted states belong, may not have recognised their independence. This was done by the British government and others in the case of the South American States, whose independence Spain has not yet recognised.

It is said that a government will be justified in refusing to receive an ambassador, if he is personally disagreeable to the state, or of a notoriously bad character. But it is now generally the practice, in order to avoid such a refusal, to inform the court beforehand of the person intended to be sent. Every government, it is also said, has a right to make general rules respecting the class of persons whom it chooses to admit; but every court would think itself aggrieved and insulted by the refusal of the ambassador it has appointed, except on specific and satisfactory grounds. There is nothing, for instance, in the general law of nations to prevent a man's being accredited by a foreign power to the government of his own country; and in this case he is clothed, as far as his character as an ambassador is concerned, with precisely the same rights as if he was a member of the state by which he is employed. But any government may, by a general regulation, refuse to admit, as France and Sweden have in fact done, any of its own subjects as the representative of an independent state.

The next great duty of a state, with respect to ambassadors sent to it, is to protect them from every thing which may in any degree interfere with the due performance of their functions. This duty commences even before the ambassador has delivered his credentials, as soon as his appointment has been notified to the court. This is the principle on which are founded what may be called the essential privileges of an ambassador.

The first of which is that of perfect security; for as he is necessarily placed among those who have always the power, and from the nature of his duties, not unfrequently the will, to molest him, it is requisite that he should be in the fullest manner protected from every kind of violence whatever, either to his person or his property. The breach of this privilege has, from the earliest ages, been considered a high offence against the rights of nations; whether proceeding from the sovereign power itself, or from the unauthorized acts of individuals.

The Porte used to violate this right, by confining the ministers of any power it went to war with, in the Seven Towers, under the pretence of protecting them from popular outrage. The last minister shut up in the 'Seven Towers' was M. Ruffin, the envoy of the French republic. Since that time, partly from some improvement in the Turks, but more from their weakness and fears, the practice has dropped, and is not likely to be renewed.

The second essential privilege of an ambassador is, that no legal process can affect him, in his person or his property; so much of his property, at least, as is connected with his official character, such as his furniture, equipages, &c. [See *Bynkerschoek de foro Legatorum.*] This privilege is analogous, and in some degree subsidiary to the former; for it would be of little avail to protect an ambassador from open outrage, if he were liable to be harassed by legal proceedings, which, if instituted (as it is always possible they should be) without foundation, would be only a cloak to violence, and even if well founded would interfere with the discharge of his public functions. Ambassadors are, therefore, deemed not to be amenable for their conduct before any criminal tribunal of the country they reside in.

It must not, however, be supposed that they are at liberty to misconduct themselves with impunity. They are bound to respect the laws and customs of the country they are in; and if they commit any offence, the sovereign may complain of it to the government they represent; or, if the case is of a more serious nature, he may demand that they be recalled, or may even dismiss them peremptorily, and in either case require that they be brought to trial in their own country. And if an ambassador is guilty of an offence which threatens the immediate safety of the state, not even the privilege of personal security will protect him from any degree of force which may be necessary to defeat his intentions: thus, if he engages in a conspiracy against the government, he may, if the circumstances require it, be put under arrest, in order to be sent home, and if he is found in arms joining in a rebellion, there is no doubt but that the principle of self-defence will justify his being treated as an enemy.

The same principle also extends to civil suits, and no claim can be enforced against an ambassador by any compulsory process whatever.

These privileges are not confined to the ambassador alone, but are extended to all his suite—his companions as they are sometimes called,—including not only the persons employed by him in diplomatic services, but his wife, chaplain, household, &c. The law of nations in this respect is fully recognized by the law of England. By the statute of 7 Anne, c. 12, all legal process against the person or goods of an ambassador, or of his domestic, or domestic servants, is declared to be void. The benefit of this Act may be claimed by any one who is actually in the domestic service of the ambassador, whether he is a British subject or a foreigner, provided he is not a merchant or trader within the bankrupt law; and it is not necessary that he should be resident in the ambassador's house. But if he takes a house, and uses it for any other purpose besides that of residence—as if he lets part of it in lodgings, he so far loses his privilege, and his goods are liable to be distrained for parochial-rates.

Whoever sues out or executes any process contrary to the provisions of the act, is punishable at the discretion of the Lord Chancellor and the two chief justices, or any two of them, as a violator of the law of nations, and disturber of the public repose;—with this exception, however, that no one can be punished for arresting an ambassador's servant, unless the name of such servant be registered with the secretary of state, and by him transmitted to the sheriffs of London and Middlesex.

The third essential privilege of an ambassador is, that his residence enjoys a security similar to that of his person and property: it is not only protected from open outrage, but it is likewise exempted from being searched or visited, whether by the police, by revenue officers, or under colour of legal process of any description whatever.

This privilege has sometimes been construed to extend so far, as to make the ambassador's residence an asylum to which any offender might flee and be out of the reach of the law; but the government has, in such a case, a right to demand that the offender be given up, and if he is an offender against the state, it is held that in case of a refusal on the part of the ambassador, it may even be justifiable, if the circumstances require it, to seize him by force.

This privilege of asylum, as it is called, was formerly granted in some cities to the whole quarter in which the ambassador resided; such was the case at Madrid, till in the year 1684 it was confined to the residence itself. Such, also, was the case at Rome to a much later period; and even at the present day some vestiges of this immunity still remain, but since 1815 it has been confined to cases of correctional police.

There are some other privileges which, though not essential to the character of ambassadors, are yet very generally admitted. Ambassadors are, for instance, in all civilized countries allowed the free exercise of their religion; they are in general exempted from direct taxation; and they are usually allowed to import their goods without paying any custom-house duties: this last privilege, however, being extremely liable to abuse, has sometimes been limited. At Madrid since the year 1814, and at St. Petersburgh since 1817, ambassadors are allowed six months to import their goods free of customs, and after that time their exemption ceases. At Berlin, they are only allowed to import goods until the duties payable amount to a certain sum.

If any violence has been offered to an ambassador, or any of his privileges have been infringed, although he may himself, if he chooses it, prosecute the offender, it is more usual for him to demand satisfaction of the government, and it is their duty to bring the offender to punishment.

The title of ambassador, in the more limited sense of the word, as it is used in the public law of the present age, is confined to diplomatic ministers of the highest order. Ambassadors, in this sense of the word, hold an office of very exalted rank; their credentials are addressed immediately from their own sovereign to the sovereign to whom they are sent; with whom they thereby are entitled to treat personally, without the intervention of his ministers, in the same manner as their master would if he were present. This is a right, however, which, at least in free states, where the ministers alone are responsible for the acts of the government, exists rather in name than in reality. The ambassadors, properly so called, are deemed to represent, not only the interests, but likewise the person and dignity of their master; but this representative character, as it is called, amounts in reality to little more than the enjoyment of certain marks of distinction; the principal of which are, that an ambassador is always styled 'Your Excellence,' which was formerly the mode of addressing a sovereign prince; 2. That he takes precedence next after Princes of the blood royal, &c.

Ambassadors are of two kinds—1. Those who reside regularly at the court at which they are accredited, to perform the usual duties of their office; 2. Those who are sent on special occasions, either on missions of important business, as the negotiation of a treaty; or more frequently on some errand of state ceremony—such as to be present at a coronation or a marriage; in which case the representative character, from the dignity with which it clothes them, is of peculiar importance. The designation of Ambassador Extraordinary was originally appropriated to those of the second kind (such as belonged to the first being styled Ordinary Ambassadors); but the title of Extraordinary, being considered more exalted, is now usually bestowed even on those who are regularly resident. To the highest order of minister belong also the Legates and Nuncios of the Pope. [See LEGATE, NUNCIO.]

The rank and pomp annexed to the office of ambassador being attended with considerable expense, and having frequently occasioned embarrassments and disputes, it was found expedient to employ ministers under other denominations, who, though inferior in point of dignity, should be invested with equal powers. The chief difference by which all the lower orders of diplomatic agents are distinguished from ambassadors, properly so called, is, that they are the representatives, not of the personal dignity of their sovereign, but only of his affairs and interests, in the same manner as an ordinary agent is the representative of his principal. Diplomatic ministers of the second order receive their credentials (like ambassadors) immediately from their own sovereign. To this order belong envoys, ordinary and extraordinary, ministers plenipotentiary, the internuncios of the pope, and the Austrian minister at Constantinople, who is styled internuncio and minister plenipotentiary. The distinction of ministers into those of the first and those of the second order began to prevail towards the end of the fifteenth century, and is said to have been originally introduced by Louis XI. of France. [See ENVOY.]

There is likewise a third order of diplomatic agents, which does not appear to have been recognised till towards the beginning of the eighteenth century. Those who belong to it are known by the title of Chargé d'Affaires (which is said to have been given by a sovereign, for the first time, to the Swedish minister at Constantinople, in 1748,) Resident, or Minister. Their credentials are given them by the ministers of state in their own country, and are addressed to the ministers of the country they are sent to; except in the case of the diplomatic agents of the Hanseatic towns, whose credentials are addressed to the sovereign. In this order may also be included the ministers, whom an ambassador or envoy, by virtue of an authority from his sovereign, appoints (usually under the title of Chargé d'Affaires) to conduct in his absence the affairs of his mission. [See CHARGE' D'AFFAIRES.]

The third order may now be considered to be subdivided into two; for at the Congress of Aix la Chapelle, in 1818, it was agreed between Austria, France, Great Britain, Prussia, and Russia, that their *Resident Ministers* at one another's courts should form, in respect of rank, an intermediate class between ministers of the second order and chargés d'affaires.

Consuls are not in general reckoned among diplomatic ministers; in some particular cases, however, (such as that of the consuls-general sent to the semi-barbarous nations along some parts of the Mediterranean coast) having diplomatic duties to perform, they are accredited and treated as ministers. [See CONSUL.]

It was long a disputed question, whether the smaller powers had a right to communicate by means of ministers of the highest order. It is now settled that this right belongs only to states enjoying royal honours,—with the exception, however, that the smaller states are permitted to send ministers of the highest order to one another if they like it. But according to the practice of the present day it is only in the intercourse between the greater powers that such ministers are employed. The courts with which the British government interchanges ambassadors, are those of Paris, Vienna, St. Petersburgh, Spain, Portugal, and Holland as it stood before the French revolution;—we also interchanged ambassadors with the kingdom of the Netherlands as long as it existed; and we are in the habit of sending ambassadors to Constantinople, but the sultan has no regular diplomatic minister resident in this country.

The rules relating to the ceremonial due to diplomatic ministers are laid down at great length by writers on the subject. The first thing to be done by a minister is to announce his arrival to the minister for foreign affairs. He is then entitled to an audience of the sovereign, either public or *private*. The *right* of demanding at all times, during his stay, a *private* audience, is the *distinction* and important privilege of an ambassador. Should his only chance of carrying a measure depend on his having a private audience of the sovereign to whom he is sent, it is evident that this might be thwarted by the sovereign's ministers, who would of right be present at the audience of any minister below the rank of ambassador. A minister plenipotentiary as well as an ambassador can claim a public audience. He there presents his credentials to the sovereign, and hands them over to the minister for foreign affairs. Ministers and envoys also present their credentials to the sovereign in person. After he has been presented to the sovereign, a minister visits all the diplomatic body. But a minister of the highest order pays *his respects in person only to those of the same rank*—with ministers of a lower order he merely *leaves his card*. When an ambassador arrives at a court, all the diplomatists there, who are not of his own rank, call on him first.

Disputes have frequently arisen among ministers of the same rank about precedence. The rules by which it has at various times been endeavoured to settle the respective rank of the representatives of each state, being founded on no solid principle, and not sanctioned by general acquiescence, it is unnecessary to mention. A rule which has long been partially adopted, may now be considered fully established: for at the congress of Vienna, in 1815, it was agreed by the eight powers which signed the treaty of Paris, that ministers in each class shall take precedence among themselves, according to the date of their official announcement at court. If the reader is curious to know wherein this precedence chiefly consists,—in what manner ministers are required to arrange themselves when they are standing up; in what, when they sit round a table: what order it behoves them to observe when they are placed in a row; what, when they walk in a line: how their rank is marked when their numbers are even; how, when their numbers are odd—we must refer him to the *Manuel Diplomatique* of the Baron Charles De Martens, chap. vi.

For further information on the subject of ambassador, he may consult Wicquefort, *de l'Ambassadeur*, *Les Causes célèbres du droit des Gens*, by C. De Martens, and the writers on the law of nations, particularly Vattel and G. F. Martens; and likewise the *Cours de droit public par* Pinheiro-Ferreira.

AMBER, a carbonaceous mineral which occurs in beds of lignite, in Greenland, Prussia, France, Switzerland, and some other countries. The greater portion of it comes from the southern coasts of the Baltic Sea, where it is thrown up between Königsberg and Memel. (Berzelius, *Traité de Chimie*, vi. 589.)

It is also stated (*An. de Chimie*, xvi. 215) that it is obtained by mining at a distance of 200 feet from the sea, and at a depth of about 100 feet, and is found in small cavities. It is occasionally met with (Aikin's *Dict. of Chemistry*, i. 57) in the gravel beds near London, in which case it is merely an alluvial product. Amber occurs generally in small pieces, which are sometimes colourless, frequently light-yellow, or deep-brown, and very commonly translucent; two large masses have, however, been found, one of them weighing upwards of thirteen pounds, and the other more than eighteen.

Amber is rather harder than common resins, which it resembles in several properties: it is susceptible of a good polish, and when rubbed becomes electrical; indeed the word *electricity* is derived from ἤλεκτρον, the Greek name for amber. Its density varies from 1·065 to 1·070: when bruised it exhales a slight aromatic odour; and when heated to 448° Fahrenheit it melts, then inflames and burns with a bright flame, and emits a smell which is not disagreeable.

The subject of the origin of amber is one which has been much discussed. According to Berzelius (*Chimie*, vi. 589), it was originally a resin dissolved in a volatile oil or natural balsam; the proofs of this opinion are, he conceives, numerous; it has often the impression of the branches and bark upon which it has flowed and solidified; it often contains insects, some of which are so delicately formed, that they could not have occurred except in a very fluid mass. Dr. Brewster (*Edinburgh Phil. Journal*, iv. 332) concludes, from an examination of the optical properties of amber, that it is an indurated vegetable juice.

Amber consists of a mixture of several substances, which are, a volatile oil, two resins soluble in alcohol and in ether, succinic acid, and a bituminous body that resists the action of all solvents, and which is the principal part of amber.

Water does not act upon this substance; it does not even dissolve any of the succinic acid. Alcohol takes up a soft, yellow, limpid resin. Cold concentrated sulphuric acid dissolves amber; the solution has a brown colour, and when water is added to it, the greater part of the amber is precipitated. Nitric acid converts it into a resinous substance, and dissolves it totally.

When amber, in the state of fine powder, is boiled in a solution of potash or of the carbonate, a great quantity of succinic acid is dissolved.

According to Drapiez, the composition of amber is as follows:—

Carbon . . .	80·59
Hydrogen . . .	7·31
Oxygen . . .	6·73
Ashes . . .	3·27
Loss . . .	2·10
	100·00

The ashes consist of lime, silica, and alumina.

This analysis can only be considered as an approximation.

Amber is employed for ornamental purposes in the manufacture of necklaces, &c. It is used also for preparing amber varnish, for obtaining a peculiar oil used in medicine, and it yields succinic acid employed in chemical investigations.

AMBERG, which derives its name from *Stadt am Berge*, or Town on the Mountain, is the capital of the circle of the Regen in Bavaria. It is a well-built and agreeable town, divided into two equal parts by the river Vils. Its public edifices consist of the handsome church of St. Martin, which is adorned with several fine monuments, a college once belonging to the Jesuits, an arsenal, guildhall, house of correction, court of appeal, lyceum, high school, seminary for the education of teachers, library, and cabinet of natural history. It has an extensive manufactory of arms, besides manufactures of earthenware, woollen cloths, tobacco, &c., and is the seat of a royal mint. There are considerable iron mines in the neighbouring 'Iron-mountains,' which produce nearly 1400 tons of iron annually; and Amberg has some trade also in salt. It lies about forty miles east of Nuremberg; 11° 48′ E. long. 49° 27′ N. lat. The number of inhabitants is nearly 8000; in 1825 it was 7680.

AMBERGRIS, a substance of animal origin, found principally in warm climates, floating on the sea, or thrown on the coasts. The best comes from Madagascar, Surinam, and Java. It has been found in the intestinal canal of the *physeter macrocephalus*, mixed with the remains of several marine animals which have served it for food; on this account it has been supposed to be a morbid product, analogous to biliary calculi.

Ambergris of good quality is solid, opaque, of a bright grey colour, which is darkest externally, and intermixed with yellow or reddish striæ. When it is heated or rubbed, it exhales an odour which is agreeable to most persons. It is sufficiently soft to be flattened between the fingers. Its fracture is fine-grained, with traces of lamellar structure. The heat of the hand is sufficient to soften it. Its specific gravity varies from 0·908 to 0·920.

When ambergris is heated with boiling alcohol of specific gravity 0·833, until it is saturated, a peculiar substance, called *ambrein*, is obtained as the solution cools, grouped in mammillated, small, colourless crystals. The solution, by evaporation, yields a further portion of ambrein, which may be rendered pure, by being redissolved in alcohol, and then crystallized.

Ambrein, thus obtained, is brilliant, white, and insipid;

it has an agreeable odour, which appears, however, to be adventitious, because it is diminished by repeated crystallizations; by fusion or a long-continued gentle heat it acquires a resinous odour.

Chemists do not agree as to its fusibility. Pelletier and Caventou found that it softened at 77° Fahrenheit, and melted at 86°; according to John it melts at about 100°, and at 112° flows like oil. When heated upon platina foil it fuses, smokes, and is volatilized, leaving scarcely any residue; by dry distillation it becomes brown, leaves a little charcoal, but is collected in the receiver, without having suffered any other material change. It is very soluble in strong alcohol, either hot or cold, in ether, and in oils, both fixed and volatile. Nitric acid converts it into a peculiar acid, called *ambreic acid;* the caustic alkalies do not form soap with it.

According to Juch and Bouillon-Lagrange, benzoic acid exists in distilled ambergris; by the analysis of John, ambergris appears to be composed of ambrein 0·85, an extractive matter soluble in alcohol, and probably containing benzoic acid, 0·025; watery extract with benzoic acid and common salt 0·015; with 0·11 not accounted for.

Ambergris is used as a perfume; and as the alcoholic solution is the most odorous preparation of it, it is generally employed in that form.

AMBERT, a town in France, in the department of Puy de Dôme, on the river Dore, a feeder of the Allier. It is a place of considerable trade; the best cheeses of the province of Auvergne are exported from it, and it has considerable manufactures of woollen stuffs, playing-cards, and especially of paper, which is considered to be among the best in France. The houses are built and the streets paved with the granite procured from the mountains to the east of the town. The population amounts to about 7000. The distance from Clermont, the capital of the department, is differently given, but it is probably about 31 or 32 miles.

It is the capital of an arrondissement containing a population of above 80,000, and comprehending 486 square miles.

AMBHEER, a town in the principality of Jeypoor, in the Rajpoot states, in 26° 57′ N. lat., and 75° 40′ E. long. This town was formerly the capital of the principality, but on the building of Jeypoor, by Mirza Raja Jeysingh, five miles south of Ambheer, the seat of government was removed to the new city, which gave its name to the principality.

Ambheer is built on the margin of a small lake, and is surrounded on all sides by mountains, which give a considerable degree of romantic beauty to the spot. A palace built on the edge of a precipice overhanging the lake, and formerly inhabited by the Rajahs, is in good preservation. It was furnished with fountains, balconies, and terraces, and contained numerous apartments of all dimensions, some of which are still exceedingly beautiful. It is remarkable that a good deal of stained glass has been used by way of ornament. This palace is now employed as a state prison.

A small island in the lake is cultivated as a royal garden. A great part of what were once magnificent buildings within the city, are in a ruinous state, and Ambheer is now nearly depopulated. Enough, however, remains to show that it must once have been a splendid place. (Hamilton's *East India Gazetteer.*)

AMBOISE, a town in France, in the department of Indre et Loire, on the south or left bank of the Loire, between Blois and Tours. It is connected with many historical recollections. In the castle of Amboise, built by Charles VII., Louis XI. instituted, in 1469, the order of St. Michael. Charles VIII., his successor, was born and died in the same edifice, and to Amboise, in 1560, the Duke of Guise removed Francis II., and defeated the plot which the Prince of Condé and the leading Huguenots had formed. Part of this castle remains; it is on a steep rock, washed by the Loire, which is here parted into two streams by a small island. From the top of one of the towers a view is obtained of the neighbouring country, called from its richness the Garden of France. The town is surrounded by vineyards. It is ill-built, but has a good bridge over the Loire, finished in 1822. The inhabitants amount to between five and six thousand, and carry on some manufactures, particularly of steel and files; the latter are in great repute.

Amboise is 22 miles W.S.W. of Blois, 15 E. of Tours, and 127 S.W. of Paris.

AMBOISE, (CARDINAL GEORGES D',) an eminent French ecclesiastic and statesman. He was born in 1460 at the château of Chaumont on the Loire, the seat of his family, which was one of the most illustrious in France Being a younger son he was educated for the church, and was made Bishop of Montauban by the time he had attained the age of fourteen. His first preferment at court was given him by Louis XI., who made him his almoner. After the death of this prince, however, in 1483, having connected himself with the Duke of Orleans, who unsuccessfully disputed the regency with Anne of Beaujeu, he shared the misfortunes of his party, and was along with the duke himself put into confinement, from which he was not released till six or seven years after, when the new king, Charles VIII., attained his majority. Soon after being restored to liberty he was promoted to the archbishopric of Narbonne, which, in 1493, he exchanged for that of Rouen. Here, besides presiding over his diocese, he acted as the deputy of his friend the Duke of Orleans, who held the office of governor of Normandy, and in that capacity introduced several valuable reforms into the administration of the province. In 1498 the duke became king by the title of Louis XII., and from this time D'Amboise may be considered as prime minister of France. The memorable events of the reign of Louis XII. are connected with the assertion of his rights to the duchy of Milan, and the protracted wars which he carried on in Italy to maintain that claim. In this part of his conduct it is probable that Louis acted rather according to his own views than by the advice of his minister; but he seems to have intrusted to the latter almost the entire management of the domestic affairs of his kingdom. In this department D'Amboise displayed equal ability and disinterestedness. By the financial reforms which he effected he was enabled both considerably to reduce the customary imposts, and to supply the heavy demands of the war without any increase of taxation. He exerted himself also, with considerable success, to rectify the existing corruptions both in the law and the church, introducing various regulations, with a view to diminish the length of processes in the former, and by his example as well as by his authority discountenancing the scandalous rapacity of the higher order of ecclesiastics. He would never accept any other benefice in addition to his archbishopric; and even the greater part of his episcopal revenue he distributed among the poor, or devoted to other pious purposes. With all this moderation, however, in regard to the more common objects of human desire, he was far from being without ambition. Very soon after the accession of Louis XII. he had obtained a cardinal's hat, and subsequently the pope appointed him to the high office of legate. But on the death of the infamous Alexander VI., in 1503, it appeared that the chair of St. Peter itself was the place which he aspired to occupy. He failed, however, in this object through a piece of mismanagement, which made him at the time very much laughed at, though it was only discreditable to him as a politician. A large military force of the king his master occupied Rome, by placing which in an imposing attitude he might easily have controlled the election; but the Cardinal de la Rovère having suggested to him that such a mode of securing his object would both have a bad look, and was moreover quite unnecessary, inasmuch as he would most certainly be elected for his own merits, if he left the matter to the free voices of the conclave, he followed this crafty advice, and withdrew the troops. The result was that in a few weeks the Cardinal de la Rovère was pope himself, with the title of Julius II. No other vacancy in the ecclesiastical throne occurred during the life of D'Amboise, who died in the convent of the Celestines at Lyons, on the 25th of May, 1510. It is said that, on his death-bed, he expressed his sense of the vanity of those worldly honours which he had sought so anxiously during his life—exclaiming, as he named the monk who attended him, 'Brother John! ah, why have I not all my life been brother John?' He was buried in the cathedral of Rouen, where his mausoleum is still to be seen. Notwithstanding some faults and weaknesses, D'Amboise was undoubtedly a great benefactor to France. This his countrymen themselves so strongly felt, that they used affectionately to call him *the people's father.* Most of the accounts of his life that have appeared in France are written in the most panegyrical style. One, by an author who calls himself the Sieur des Montagnes, printed in 12mo. at Paris in 1631, commences with the most honest avowal of a partial intention which we recollect to have met with in any historian; 'My design,' says this writer, 'is no other than, according to my custom, to take up the cause of the king, to defend his ministers, and throughout to pay respect to those to whom we are naturally bound by their rank and dignity, in conformity with the commandment of God to revere the superior powers.' There is another work, entitled *A History of the Administration of the Cardinal D'Amboise*, by the Sieur Michel Baudier, historiographer to his majesty, published in 4to. at Paris, in 1634, the character of which may be likewise judged of from its first sentence: 'Beloved country,' exclaims the learned historiographer royal, 'mother of kingdoms, companion of the empire, vast and precious heritage of the greatest kings of the earth; beloved France, all who have ever spoken of you, inspired by the truth, have preferred your glory to that of the monarchies which surround you, and have raised your praises as far above theirs as the height of the lofty pines surpasses the lowliness of the little shrubs.' M. Baudier then proceeds to characterise the inhabitants of France as the first of nations—and finally enters upon the proper subject of his book, by describing the cardinal as the first of Frenchmen. The letters of Louis XII. and the Cardinal D'Amboise were published at Brussels in four volumes 8vo., by Jean Godefroy, in 1712.

AMBOOR, a neat and regularly built town of the Carnatic province, in the south of India, situated in 12° 49′ N. lat., and 78° 46′ E. long. It stands within a range of hills of moderate elevation. The river Palaur, or Milk river, passes within three miles to the southward of the town, and falls into the bay of Bengal, about 50 miles S.W. of Madras.

Amboor was formerly a place of considerable strength, having a lofty isolated mountain at its side on which a fort was built, so difficult of approach as to be considered almost impregnable. Since 1801, when Amboor came into the possession of the East India Company, the works of this fort have been partially destroyed; the part which remains is now used as a place of confinement for criminals.

The neighbouring territory is very productive. It is watered by numerous small streams which run from the river Palaur along the heights, and are employed for irrigating rice-fields, and tobacco-plantations. A great number of date trees are cultivated which yield a considerable quantity of coarse sugar. Many of the inhabitants are employed in the preparation of castor-oil, which is exported in considerable quantity. Amboor is 108 miles W.S.W. from Madras. (*Asiatic Researches*.—Hamilton's *East India Gazetteer*.)

AMBOYNA is one of the Molucca, or Spice Islands, in the eastern seas, lying off the south-west coast of the larger island of Ceram. The length of Amboyna is about thirty-two miles, and its average breadth ten miles. Its south-west coast is indented by a bay so deep, that the island is nearly divided by it into two unequal limbs, which are connected at the head of the bay by a narrow isthmus. The two peninsulas, into which the island is thus divided, are called Hitoe and Leytimor; the former lies to the north-west, and comprises full two-thirds of the surface of the island. In 1683 the Dutch governor attempted to cut through the isthmus, which is called the pass of Baguewala, in order to open a more direct communication with the small islands of Saparoua, Oma, and Harocha. Vessels which trade between the town of Amboyna and these islands are now obliged to pass down the bay of Amboyna and round one or other of the peninsulas. The construction of the necessary canal would have been much facilitated by the existence of a little river called Matta Passo, or the Eye of the Pass, and considerable progress had been made towards its completion, when it was stopped through the superstitious fears of the natives. The Bay of Amboyna is five leagues long from its entrance: its breadth varies considerably; in some parts it is not more than a Dutch mile across.

Amboyna is a mountainous place, abundantly furnished with trees and underwood. The variety of trees growing on the island is so considerable, that the great naturalist Rumphius is said to have possessed a cabinet inlaid with specimens of 400 different kinds. Notwithstanding this, the quantity of building timber is so small, that importations are constantly made from Java. Lingoa wood, commonly known as Amboyna wood, is principally procured from Ceram. The soil is for the most part a reddish clay; in the valleys it is of a darker colour, and mixed with sand. Sulphur is produced among the hills, some of which are encrusted with a copious efflorescence of that mineral. The island is considered healthy, notwithstanding the great heat of the climate. It is remarkable that to the eastward of the 120th degree of longitude, the monsoons are directly the reverse of what are experienced to the westward of that line, so that the weather is fine and dry on the east-coast of Celebes, in the Moluccas and the adjacent islands, when the contrary state prevails at Sumbhawa, Lombok, Java, and Borneo. On the other hand, it is dry in these islands, while the Moluccas are deluged with rain, which at those seasons is so heavy in Amboyna, that the merest rivulets are swoln into mighty torrents, which overflow their channels, and bear down every thing that opposes their progress. It is only at such seasons that Amboyna can be said to have any rivers: at other times the streams are not deserving of the name. Four of them, Way Tome, Way Alla, Way Nito, and Bato Gadja, or Elephant's River, which rise in the mountains of Leytimor and discharge themselves into the sea near the town, are not more than from two to three feet deep during the dry season.

The earliest visit made to Amboyna by any Europeans was in 1511, when the Portuguese viceroy, Albuquerque, despatched a squadron from Malacca, which returned with a lading of spices, having been received with kindness by the natives. Ten years afterwards a squadron of Portuguese ships was sent to take formal possession of the Spice Islands, in the name of the King of Portugal. The commander established himself in the Island of Ternate as his head-quarters, and the dominion of the Portuguese over the Moluccas continued for sixty years, during which time the natives endured from them every species of tyranny and cruelty.

At the commencement of the seventeenth century, these islands were taken from the Portuguese by the Dutch, their conquest being facilitated by the anxiety of the natives to be rid of their first European oppressors. Unhappily, the change of masters brought with it no change for the better in the condition of the people, who were subjected to every kind of injustice which the cupidity of their Dutch rulers could suggest. As a consequence of this treatment, the inhabitants of Amboyna were continually in arms, and the country became the constant scene of strife and desolation.

At a very early period after its first formation, the English East India Company endeavoured to appropriate to itself a share in the spice trade. In 1604, the Company sent out a second expedition, consisting of four ships, under the command of Sir Henry Middleton, one of which ships obtained a lading of cloves at Amboyna. In 1612, the Company formed a settlement at Cambello in this island, from which the settlers were forced to retire in June, 1614. An attempt was made to accommodate the dispute between the English Company and the Dutch, relative to the right of trading with the Spice Islands, and a treaty for this purpose was concluded in London, in July, 1619. But so many disputes occurred in executing the provisions of this treaty, that the grounds of contention appear to have been multiplied rather than reduced, and at length reached such a point, that under the accusation of conspiring to surprize the garrison, and expel the Dutch from the island, Captain Towerson and nine Englishmen, with nine Japanese, and a Portuguese sailor, were seized at Amboyna, tried, pronounced guilty, and executed. This event, known as 'the massacre of Amboyna,' excited the greatest indignation in England, and became the subject of the most formal remonstrances on the part of the British government.

During the war with Holland, in 1796, Amboyna was captured by a British force under Admiral Rainier. It was restored at the peace in 1801, was taken again by the English in 1810, and was again given up to Holland at the treaty of Paris in 1814. While the English retained possession of the island, the East India Company was not unmindful of the moral improvement of the natives. It furnished the means for establishing upwards of forty schools on the Lancasterian system, and granted the sum of 10,000 rupees to assist in publishing a version of the Bible in the Malay language.

The main object of the different European powers, who endeavoured to possess themselves of Amboyna, was to monopolize the trade in cloves, the cultivation of which spice forms the principal object of industry with the natives. With the desire of keeping the cultivation of the clove-tree completely within their power, the Dutch caused it to be extirpated from every island with the exception of Amboyna, where they provided for a sufficient production of the spice, by obliging every native family to rear a certain number of clove-trees. In the prosecution of their plans, the island was divided into 4000 allotments, each one of which was expected to support 125 trees, and a law was passed in 1720, rendering it compulsory upon the natives to make up the full complement. The number of trees upon the island accordingly amounted to 500,000, the average produce of which exceeded one million of pounds of cloves annually.

The cajuputi-tree, whence the medicinal oil of that name is procured, grows in Amboyna, which also produces all the vegetables and fruits commonly found in that quarter of the globe. The woods contain great numbers of deer and wild hogs, the flesh of which forms a principal article of food with the natives. Buffaloes, cows, horses, sheep, and goats, have been introduced by the Portuguese and Dutch from Java and Celebes. The Bay of Amboyna formerly abounded with fish of all the kinds usually found in the eastern seas; but it is said that since the earthquake which occurred at Amboyna in 1754, their number has been very greatly diminished.

Amboyna is inhabited by four different races of people, the Aborigines, the Amboynese, Chinese, and Europeans. The first of these races, called Horaforas, are, according to some accounts, a wild and savage race, possessing a great deal of muscular strength, and every disposition to use it to the annoyance of the other inhabitants. Their numbers are now much reduced. The Amboynese are the descendants of Malays, and were found on the island when the Portuguese first landed there. At present the Amboynese are an indolent effeminate race: the greater part of them profess the religion of Mohammed; a few have been converted to the Catholic faith by the Portuguese, or to Lutheranism by the Dutch. The Chinese settled at Amboyna are not numerous; but they are very industrious and enterprising traders. Still fewer are the European race of inhabitants. They are principally Dutch, and the descendants of Dutchmen, many of them being the offspring of Amboynese mothers.

The town of Amboyna, which is in 3° 40′ S. lat., and 128° 15′ E. long., is built within the bay, in the peninsula of Leytimor. It is clean, neat, and built with regularity. The houses are of wood, only one story high, and the roofs are covered with interlaced branches and leaves of palm trees. The town contains an hospital, a town-house, and two churches, in one of which service is performed in the Malay language. The western quarter of the town is inhabited by Chinese, and the Europeans occupy the south end, near which is the burial-place of Rumphius. Fort Victoria in the front of the town is, in form, an irregular hexagon, with a ditch and covered way on the land-side, and a hornwork towards the sea. (Crawfurd's *History of the Indian Archipelago*; Mill's *History of British India*; Porter's *Tropical Agriculturist; and Reports of the House of Commons on the Affairs of India*. Wilcock's *Translation of* Stavorinus's *Voyages*. For the rest of the islands of this groupe, see MOLUCCAS.)

AMBROSE (SAINT) was born, some of his biographers state, in the year 333, but more probably about 340. His family had long been one of distinction in Rome; and his father, whose name was also Ambrosius, held the high office of prefect of Gaul. In this province Ambrose was born, and probably in the town of Trier or Treves, then called Augusta Treverorum, which was the principal seat of the prefecture. He was educated at Rome under the ablest masters; after which, he and his brother Satyrus proceeded, with the view of following the legal profession, to Milan, then the residence of the court, and as such considered the capital of the western empire. Ambrose soon acquired distinction at the bar; and this, with the interest of his family, introduced him to civil honours. While yet a young man he was appointed governor of Liguria, the province to which the city of Milan then belonged. In this office he conducted himself in such a manner, as to secure at once the approbation of the emperor, and the general esteem and attachment of the people. Thus situated, he had reached his thirty-fourth year, when an incident happened which suddenly changed the entire course of his life. In A.D. 374, died Auxentius, the Archbishop of Milan, on which, a violent contest immediately arose, as to the appointment of his successor, between the two great parties which then distracted the church—the Orthodox and the Arians. On the day when the election was to take place, the ferment was so violent, that Ambrose was induced to try what could be done to allay it by his influence with the people; and having accordingly presented himself before them, he addressed them in a speech, recommending the observance of greater order and decorum. His speech was well received, for Ambrose excelled in the art of popular persuasion; and as soon as he had concluded, a little boy in a distant part of the crowd, called aloud, *Ambrosius Episcopus!* (Ambrose Bishop.) In that age, and especially in such a state of excitement, these words were deemed a direct intimation from heaven; and, being instantly taken up by a thousand other voices, the assembly came to a unanimous resolution that Ambrose should be placed in the vacant office. From the subsequent conduct of Ambrose, some suspicion arises that the whole was partly a scheme of his own. He professed the utmost reluctance to accept the episcopal dignity, and some of the expedients to which he resorted, as related on the unexceptionable authority of his secretary Paulinus, with the view of making it appear that he wished the people to alter their choice, were not a little extraordinary. He even ran away from Milan, till, as is said, having walked for some hours, he found to his surprise that he had only got back again to one of the city gates. He was, however, at last prevailed upon, by the express command of the emperor, to mount the archiepiscopal throne. Although he had been educated in the Christian religion, his baptism had never yet taken place; and he was actually consecrated on the eighth day after undergoing that rite.

The extraordinary piety and zeal of the new archbishop soon rendered him the wonder of the church. Females, in particular, we are told, actuated by the fanaticism of the age, used to come in great numbers from every quarter of the Christian world to receive the veil from his hands. But, in addition to his pastoral and other sacred labours, Ambrose acted a distinguished part in the political affairs of his time. For a tolerably full, and, upon the whole, not an unfair account of this part of his career, the reader may consult the twenty-seventh and twenty-eighth chapters of Gibbon. While he lived, he was consulted on all great emergencies, both by Theodosius, the emperor of the East, by Valentinian II., the western emperor, and even by the mother of the latter, the empress Justina, notwithstanding her attachment to the Arian heresy, of which Ambrose was the most determined opponent. The empress was particularly anxious that Ambrose should resign two, or at least one, of the Milan churches to the use of the Arians; but this demand the bishop pertinaciously resisted; and as he was supported in his opposition by the people, whose violence, he remarked, he had not excited, but God alone could quell, Justina was soon glad to give up the contest. It was, according to one account, upon obtaining this triumph, that St. Ambrose composed the celebrated hymn of thanksgiving, the *Te Deum Laudamus*, which has long formed a remarkable part of the service of the Roman church, and has also been retained in the church of England liturgy. But it is now allowed by the Roman Catholic critics themselves, that the *Te Deum Laudamus* is of an age considerably later than that of Ambrose.

Ambrose went twice, at the instance of Justina, on an embassy to the rebel Maximus, who disputed the empire with the sons of Valentinian; the first time, soon after the murder of Gratian at Lyons, on the 23d of August, 383, when, after remaining at Treves for above a year, he prevailed upon Maximus to forego his intention of invading Italy. The second attempt of the same kind, made some years later, was not attended with the same success; but the career of Maximus was soon after terminated by the victorious arms of Theodosius. This celebrated emperor of the East, attached as he was to the orthodox faith, was one of the most revering admirers of the Archbishop of Milan: but when in 390 Theodosius, carried away by a blind passion, barbarously gave orders for a general massacre of the inhabitants of Thessalonica, by way of punishment for an outrage committed by a few individuals, Ambrose expressed in severe terms to the imperial criminal his abhorrence of an act so inhuman; nor would he again admit him to the communion of the faithful, until he had been subjected to an exclusion of eight months' duration, and had publicly performed penance, in the guise and attitude of a suppliant, in the great church of Milan. Ambrose died at Milan on the 3d of April, 397; and the great church, from its being made the depositary of his body, received the name of the *Basilica Ambrosiana*. This celebrated prelate is one of the most remarkable of those individuals who, in different ages, and in all professions, have gained an extraordinary ascendancy over their fellow men, and by that means have contrived to direct or powerfully influence the affairs of the time. To a knowledge and skill in the practice of the arts by which the common mind is won, such characters have invariably united great energy, unfaltering devotion to their objects, and very frequently not much scrupulousness as to the means of attaining them. Of this last-mentioned qualification, as well as of the others, Ambrose possessed far from an inconsiderable share,—as might be easily shown by a more minute examination of his life than it has here been possible to attempt. Persons of this description, however, being usually distinguished by greater vigour of the active than of the speculative faculties, have seldom left much behind them, or exercised, otherwise than by their example, any enduring influence over the opinions and conduct of mankind. And so it was with the subject of the present article. 'Ambrose,' says Gibbon, 'could act better than he could write. His compositions are destitute of taste or genius; without the spirit of Tertullian, the copious elegance of Lactantius, the lively wit of Jerom, or the grave energy of Augustin.' The best edition of the works of St. Ambrose is that published in two volumes folio, Paris, 1686 and 1690, by the Benedictine monks; the brothers J. Du Frische and N. Le Nourri were the editors. The first piece in this collection is a treatise in six books, entitled *Hexaemeron*, being an account of the creation. It is said to be in the greater part translated or pilfered from a work of St. Basil's on the same subject,—though it also contains many things from Pliny and other sources, and some that are either the author's own, or have been taken from older works that are now lost. It is rather a curious production, considered as illustrative of the state of natural knowledge in the fourth century. One of the ablest of Ambrose's literary performances is reputed to be his treatise in three books, *De Officiis Ministrorum*. Of his other treatises many are written in recommendation of his favourite moral virtue, celibacy. Upon this topic the Benedictine collection contains three books *De Virginibus*, one *De Viduis*, one *De Virginitate*, one *De Institutione Virginis*, one entitled *Exhortatio Virginitatis*, and one *De Lapsu Virginis Consecratæ*. Many of Ambrose's letters have also been preserved; and these form the best sources for his biography. His *Offices* and several of his other pieces have been translated into English, and there are also French translations of some of them. Besides his life by Paulinus, already mentioned, and another memoir of him in Greek, which appears to be mostly copied from the ecclesiastical history of Theodoret, the Benedictine editors have given at the end of their edition an ample biography of the saint, collected principally from his own writings. Upon this subject also a large body of information is to be found in the *Mémoires pour servir à l'Histoire Ecclésiastique des Six Premiers Siècles*, par M. Le Nain de Tillemont; tom. x., pp. 78—306, and 729—770. 4to., Paris, 1705. See also *Cave, Scriptorum Ecclesiasticorum Historia Literaria;* folio, Colon. Allobrog. 1720: pp. 165—169. Ambrose, according to St. Augustin, was the first who introduced the singing of psalms into the western church. The practice had prevailed before in that of the east.

AMBROSIAN LIBRARY at Milan. The Ambrosian Library owes its existence to the munificence of Cardinal Frederick Borromeo, archbishop of Milan. He laid the foundation of it in 1602, and it was opened to the public in 1609. Its name was given in memory of St. Ambrose, archbishop and patron saint of Milan. Frederick Borromeo not only placed his own collection of books in this library, but sent his librarian, Anthony Oggiati, into different countries to purchase additions. Montfaucon assures us that numerous manuscripts were obtained for it from Thessaly, Chios, Corcyra, and Magna Græcia: the founder added to these some very valuable accessions from the monastery of Bobbio (anciently Bobium), in the northernmost Apennines, together with a considerable assemblage of manuscripts from the Pinelli collection: the latter cost no less than three thousand four hundred ducats. It was the founder's original intention to join to the endowment of his library a college of sixteen learned men; but the want of funds reduced the number to four: of these, one translated Greek, a second taught Hebrew, a third Arabic, and a fourth was to make collections of whatever was valuable in authors. The Ambrosian Library now contains about forty thousand printed volumes, with rather more than fifteen thousand manuscripts; and annexed to it is a gallery of pictures, statues, antiques of various kinds, and medals, all containing numerous articles of rarity and reputation. Many of its curiosities of every description were carried to France during Bonaparte's campaign in Italy, and with them a manuscript collection of the works of Leonardo da Vinci, accompanied with drawings and designs, which a citizen of Milan, of the name of Galeas Arconati, refusing every lucrative offer from private persons, had given to the Ambrosian Library. One volume of this collection was returned to the library after the Peace of Paris in 1814, but the remaining volumes, having been sent to the library of the Institute and not to the Bibliothèque du Roi, it was not at the time of the reclamation known were they were, and it is believed they are yet retained in Paris. Another rarity belonging to the Ambrosian collection is a manuscript of *Virgil*, the margins of which are interspersed with notes in the hand-writing of Petrarch: the *Palimpsesti*, or rescript manuscripts, edited between 1814 and 1816 by Angelo Maio, were discovered in the Bobian portion of the Ambrosian collection. Oggiati, Muratori, and Maio, have been the three most eminent librarians of this library. Maio is now the librarian of the Vatican. The hall of the Ambrosian Library is well proportioned, though not so large as might be expected for a collection of books and manuscripts so considerable. The ceiling is adorned with paintings, and the space between the book-cases and the cornice filled up by the portraits of the most eminent authors, whose writings are deposited below. For further information on the Ambrosian Library we refer to Boscha *de Origine et Statu Bibliothecæ Ambrosianæ Hemidecas*, 4to. Milan, 1672; Saxius *de Studiis Literariis Mediolanensium Prodromus*, 8vo. Milan, 1729, p. 147; and Montfaucon's *Diarium Italicum*.

AMBUSC'ADE, a military term, derived from the Italian *imboscata*, something hidden in a wood. The older English word *ambush*, is the same word, the analogy of which would be more clearly seen if the word began with *i*, *imbush*, as in *impound*, *immerse*, *impress*, &c. It signifies an attempt to lie in wait for and attack an enemy, without his perceiving the intention until he is attacked. In antient times before the art of war was as complicated as at present, this mode of secret attack was common and frequently successful, and is so still among savage nations; in modern times it does not appear to be thought much of, for we do not find any particular stress laid upon it in works upon the military art.

We do not include in this word an attack which, though unexpected and sudden, is made while the other party is aware of an enemy somewhere in the neighbourhood; or an unexpected attack made upon the enemy in his position, which is called a surprise.

AMBULANCE (from *ambulare*, to walk or march), a French word applied to the moving hospitals, which are attached to every French army or division of an army, for the purpose of rendering immediate assistance to sick or wounded soldiers. In every European army surgical and medical aid has long been provided with more or less care, but it is chiefly due to the skill and humanity of the French surgeons, (especially the celebrated Larrey,) during the wars of Napoleon, that great improvements have been generally introduced into this important department; and that the wounded and exhausted, instead of being neglected or left to chance relief, are sought out with the utmost promptitude, and carefully removed to the *ambulance*, which is placed out of the reach of the enemy's fire.

AMBULATORY, in a substantive sense, a place to walk in. With reference to buildings, this term may be applied to the space enclosed by a colonnade or an arcade. In the peripteral temple of the Greeks, the lateral or flanking porticos are properly termed ambulatories; the cloister of a monastery is surrounded by an ambulatory or ambulatories. Of the former, or external colonnaded ambulatory, the porticos of the *Bourse* or Exchange at Paris afford a good modern exemplification; and of the latter, or internal arcaded ambulatory, there can be no better than that afforded by the Royal Exchange in London. The aisles (see AISLE) of the antient Basilica, and those of its representative in later architectural works, the cathedral, or other large church, are sometimes called ambulatories.

In an adjective sense, ambulatory may be applied to any thing, the functions of which require it to move from place to place. Formerly the Parliament and the Court of King's Bench in this country were termed ambulatory courts, because they were held sometimes in one place, and sometimes in another; indeed, wherever the king happened to be.

Ambulatory is formed from the Latin word signifying *to walk*.

AMED, or KARA AMID, (Black Amid,) a town of Mesopotamia, called DIARBEKR by the Arabs.

AMELAND, a small island belonging to the Dutch province of Friesland: it lies in 53° 27′ N. lat. and is about twelve miles long. It contains some good pasture land; some of the inhabitants make lime of the sea-shells found on the coast, and many of them are fishermen. The population is about 3000.

Ameland is one of that series of islands which extends along the coast from the extreme point of North Holland, and once formed a part of the main land from which they have been detached by the violence of the sea. (See ZUIDER-ZEE.) The passage between Ameland and the Frisian coast is dangerous from its shoals. The channel is called a *watte* or ford.

AMELOT DE LA HOUSSAYE, (ABRAHAM NICOLAS,) a political writer, was born at Orléans, in 1634. He accompanied the President of St. André, appointed ambassador of France at Venice, in 1669, as secretary. A stay of several years in that city having enabled him to become acquainted with its history and politics, probably induced him to translate Velferus's *History of the Government of Venice*, and to add historical and political notes, which, at the same time that they threw a great light on the Venetian government, gave such offence, that, it is said, a formal complaint was made to Louis XIV., who sent Amelot to the Bastille. No other particulars of Amelot's life are recorded; all that is known is that he was extremely poor, and subsisted on the bounties of an Abbé. He died at Paris in 1706.

He left the following works:—Sarpi's *History of the Council of Trent*, translated from Newton's Latin version—*The Courtier*, translated from the Spanish—*The Prince*, translated from Machiavelli; he endeavoured also to vindicate the author, by maintaining that he had only described what princes do, and not what they ought to do—a translation of *Tacitus*, with historical and political notes: he did not complete this work; the six last volumes are by François Bruys—*Memoirs, Historical, Political, Critical, and Literary:* this work is also incomplete; it is arranged alphabetically, but does not go beyond half the letters. There are also some other works of no great interest, of which a list is given in *Mémoires de Miéron*, vol. xxxv.

AMEN, a Hebrew word, properly signifying 'firmness,' and hence 'truth,' which has been adopted without alteration in various languages.

Its most frequent use is at the conclusion of prayers, thanksgivings, and denunciations, where it is understood to express belief, assent, and concurrence in what has been expressed. Examples of its use in all these cases are numerous in the Bible. When the priest has declared to the woman suspected of adultery the effect of the water of jealousy, 'the woman shall answer, Amen, amen.'—Numb. v. 22. When curses are pronounced against the wicked in Deut. xxvii. 15, all the people are ordered to repeat amen.

The word amen concludes all the gospels, and almost all the epistles; it is repeated at the end of four of the five sections of the Psalms according to the division of the Jews; namely, the 41st, the 72nd, the 89th, and the 106th Psalms: in this last Psalm it is followed by hallelujah, which word concludes the last section.

In many churches in England, the word amen is pronounced aloud by the people: this was the antient practice of the Christian world, and St. Jerom relates, that when the congregated people at Rome pronounced amen, the sound was like that of a clap of thunder. They possibly attributed great efficacy to the loudness of their voices, after the example of the Jews, who imagined that this word, shouted forth with great force, had power to open the gates of heaven.

Amen is often used by our Saviour at the beginning of a discourse, as an impressive particle, which in our version is rendered 'verily.' In the Gospel of St. John the word is always repeated.

In one instance this word is used as an adjective, meaning certain, fixed. 'For all the promises of God in him are yea, and in him Amen,' 2 Cor. i. 20. In one other instance the word denotes our Saviour. 'These things saith the Amen,' Rev. iii. 14.

AMENDE HONORABLE. Amende in French is a penalty, so called from being regarded as a compensation for, or rectification and amendment of, the offence According to the old laws of France, persons guilty of crimes coming under the head of public scandals, such as sedition, sacrilege, fraudulent bankruptcy, &c., used often to be condemned, sometimes as their whole punishment, and sometimes as only part of it, to make a public confession of their guilt. This was called making the *amende honorable*, which was either simple, or *in figuris*, in which last case the culprit was conducted by the public executioner into open court in his shirt, with a rope about his neck, and a lighted torch in his hand, and in that state made his confession on his knees. The amende honorable was accounted an infamous punishment, and appears to have been so called as consisting altogether in the disgrace, and not in any fine or other actual suffering. It was considered a mere *honorary* penalty, and called in Latin *mulcta honoraria*. The courts, however, were also sometimes wont to order a person by whom the reputation or honour of another had been injured to make a public acknowledgment of the wrong; and such a sentence carried no infamy with it. It is from this latter custom that the modern and popular use of the expression has been borrowed, according to which we say that a person makes the amende honorable when he publicly admits any wrong which he feels that he has done to another person.

AMENDMENT, in Law, signifies the correction of mistakes in the written records of judicial proceedings. In early periods of the history of English law, the pleadings between the parties were conducted orally, or *ore tenus*, as it was technically called, at the bar of the court by their respective advocates. If, therefore, any mistake occurred in the pleadings of either party, it was corrected at once upon a suggestion made to the court. Subsequently, when pleading *ore tenus* was superseded by the present practice of delivering written pleadings from one contending party or his attorney to the other, it was considered reasonable to continue the same indulgence as to amendments. Hence it has been usual at all times for the courts, upon application made by either party, to amend the interlocutory proceedings in a cause; and at the present day, the courts will always amend mistakes in the pleadings, whilst they continue in paper, upon proper and equitable terms. But in antient times, after the proceedings were once entered on record, the judges of the different courts always considered that they had no authority by the common law to alter them in any respect; either for the purpose of correcting false Latin, of supplying a word, syllable, or letter accidentally omitted, or of removing any other clerical error. The consequence of which was, that after a suit was decided in favour of a party, it frequently happened that his adversary discovered some blunder made by the officer of the court on making up the record; and by bringing a writ of error, he deprived the successful party of all benefit from the judgment which he had obtained. This inconvenient rule appears to have arisen out of a rigid observance of the words of an ordinance of Edward I., which directs the judges to record the pleas pleaded before them, but forbids them 'to make their records a warrant for their own misdoings, or to erase or *amend* them, or to record anything against their previous enrolments.' (*Britton*, p. 2.) These words obviously imply nothing more than a reasonable restriction upon the alteration of the records of courts of justice clandestinely and for sinister purposes, and certainly do not justify the absurdly strict interpretation afterwards applied to them. To the rule, however, thus established there were several exceptions:—1. All errors in records might be amended during the same term in which they were made, because it was said, that in contemplation of law the record is in the breast of the judges during the term, and not on the roll. 2. In an essoign, or excuse by a defendant for not appearing to a writ in proper time, if the plaintiff's name were mistaken, the mistake might be amended, because it was inconsistent with the writ, and, if enrolled in its erroneous form, it would be a record against a previous enrolment, and for that reason a breach of the ordinance of Edward I. 3. For the same reason, a continuance, which is an entry on the record showing the continuation of a cause from one term to another, might be amended so as to make it correspond to the proceedings previously recorded.

It is plain that these ingenious exceptions must have afforded but little relief from the oppressive strictness of the rule; and in cases which did not fall directly within them, the judges always held that they were bound by the ordinance of Edward I., and refused to rectify the most palpable errors after the expiration of the term to which the record belonged. It is probable that the judges may have adhered thus closely to their interpretation of the ordinance from a reasonable regard to their own safety; for in the seventeenth year of the reign of Edward I., (1289,) we find that king instituting a prosecution of enormous severity against the judges, and imposing upon them fines amounting altogether to upwards of 100,000 marks or near 70,000*l.* for imputed offences, connected for the most part with the erasure and alteration of the records. With the fear of this formidable infliction before their eyes, which it might be very convenient to a monarch engaged in expensive wars to repeat for the purpose of replenishing his coffers, the judges of those days were perfectly justified in erring on the side of caution, by adhering to the strict letter of the ordinance.

But this rigid abstinence of the judges from all alteration of their records was necessarily a great inconvenience in the administration of justice, and led in course of time to a series of legislative enactments, called statutes of Amendment and statutes of *Jeofails*, (*jeo fail* or *j'ai faillé*,) by the former of which, express authority was given to amend certain specified errors in the records; and by the latter the judges were empowered to proceed to judgment notwithstanding such errors. The first statute of amendment was the 14th Edw. III. c. 6, (1340,) which enacted that no *process* should be annulled by a clerical mistake in 'writing one *syllable* or *letter* too much or too little; but that as soon as the thing was perceived by the objection of the party, or in other manner, it should be hastily amended in due form, without giving any advantage to the party who objected to the mistake.' Still the judges exhibited great reluctance to depart from the letter of the statute, and much doubt and discussion arose in the courts, whether the statute, though it authorized the amendment of a *letter* or *syllable*, extended to the case of a *total omission* of a word. In a case in which this point was raised some years after the statute had been passed, the judges resolved to incur no personal danger by deciding it, but formally consulted the law-makers upon the meaning of the act. 'I went,' says Chief Justice Thorpe, who describes this conference in a case in the Year Book, (40 Edw. III. c. 34,) 'together with Sir Hugh Green, to the parliament, and there were twenty-four of the bishops and earls; and we demanded of them who made the statute, if the record might be amended; and the archbishop or metropolitan said, that it was a nice demand and a vain question of them, if it might be amended or not; for he said that it might as well be amended in this case as if it were but one letter, for if a letter or syllable fail in a word, it is no word; wherefore, if all the word fail, it may be amended as well as if it failed but of a letter or a syllable; for there is no more difference in the one case than in the other.' Upon this sensible advice and reproof of the archbishop, the judges admitted the amendment of a word.

In consequence of the indisposition of the judges to give this statute a liberal interpretation, of which the above black-letter anecdote is an instance, it proved in a great measure ineffectual; for though the terms of it appear to extend to every part of civil or criminal proceedings in which a clerical mistake has been made, they construed the word 'process' in the act of parliament strictly, and confined amendments to civil suits, and in them to errors in the entry of the processes for the defendant's appearance and for summoning the jury. If, therefore, a mistake occurred in the entry of the process which was wholly immaterial, it was amended; but if a mistake of a word, syllable, or even a letter, was made by the clerk in drawing up the plea-roll or body of the record, the whole proceedings might be annulled by a writ of error. To remove this gross absurdity, and to enlarge the power of judges in amendments, the statutes 8 Henry VI. c. 12 and c. 15 (1430) were made, by which the judges were authorized, 'in any record, process, word, plea, warrant of attorney, writ, pannel, or return, to amend all that which to them seemed to be the misprision of the clerk;' and also the 'misprisions of sheriffs, coroners, bailiffs of franchises, or other officers in their returns.' Appeals, indictments of treason and felony, and outlawries for treason and felony, were, however, expressly excepted from the operation of the statutes of Henry VI.

But these latter enactments, which were, properly speaking, the only statutes of *amendment* in ancient times—those which followed being statutes of *Jeofails*—though they considerably enlarged the power of the judges in making amendments, proved but an insufficient relief to suitors; for they extended only to the amendment of what the judges should interpret to be the misprision of their clerks, and upon this point subtle doubts and nice distinctions were suggested by the acuteness of legal criticism, and multiplied to an enormous extent in the course of the ensuing century; in consequence of which, just and lawful judgments were continually overthrown by formal objections, founded on errors which the courts did not consider to be strictly *clerical* misprisions.

The next legislative provision upon this subject was a statute of Jeofails which was passed in 1540, (32 Henry VIII. c. 30,) by which it was enacted, that 'where the jury have given their verdict for either party in any court of record, and a jeofail or mistake is afterwards discovered, the judgment of the court shall stand according to the verdict without reversal.' This was followed by the statute 18 Eliz. c. 14, (1572,) which declares, 'that after verdict given in any court of record, judgment shall not be stayed or reversed for false Latin or other faults in form in original and judicial writs, counts, &c., or for want of any writ, or by reason of the imperfect return of any sheriff, or for want of any warrant of attorney.' The 21st Jac. I. c. 13, (1623,) specifies several other formal defects not mentioned in the previous statutes, and declares, that on account of such defects, when discovered after verdict, no judgment shall be stayed or reversed. The next statute of Jeofails, in chronological order, was the 16th and 17th Car. II. c. 8, (1665,) called by Mr. Justice Twisden 'the Omnipotent Act,' which was intended to remove doubts arising upon former laws as to the distinction between matters of form and matters of substance, and also specified a great variety of minute technical defects, which after verdict were not to arrest or stay the judgment of the court. The statutes which have been above mentioned, were calculated almost exclusively to aid imperfections in form after the verdict of a jury had passed upon the facts. This limitation was extremely unreasonable and prejudicial, as it enabled a party who made no defence, and had no substantial defence to make, to defeat a just action, by taking formal objections to the record in arrest of judgment, or upon a writ of error, of which he could not have availed himself after a verdict. To remedy this inconsistency, the celebrated statute for the amendment of the law, introduced by Lord Somers, after his retirement from the office of chancellor in 1705, (4 Anne, c. 16,) extended the operation of the statutes of Jeofails to all cases of judgment by confession or default.

From this summary view of the older statutes of Amendment and Jeofails, it appears that since the time of Henry VI. the legislature discontinued the more direct and convenient mode of obviating the evil by allowing the judges to amend formal errors in their records where justice required it, and adopted a more circuitous and uncertain course, by specifically enumerating certain errors and mistakes which were not to deprive the successful party of his judgment. Perhaps the extreme caution of the judges in former times, in adhering rigidly to the letter of the power delegated to them, may have suggested to the legislature this variation from their original course; but, however this may have been, there can be no doubt that the authority to amend under certain restrictions was the more efficient remedy. The statutes of Jeofails have only given imperfect relief to suitors; for professional ingenuity has never failed to discover new errors not specified in them, and to draw subtle distinctions in cases where the words of the statutes were to a common understanding distinctly applicable.

In modern times a disposition has been manifested to proceed upon the ancient course, by increasing the authority of judges to amend the records of their courts in certain cases. Thus, a most important improvement was introduced into the administration of justice by the statute of 9 Geo. IV. c. 15; which enabled 'any court of record in civil actions, any judge at *Nisi Prius*, and any court of Oyer and Terminer, and gaol delivery, if such court or judge should see fit so to do, to amend the record upon the appearance of a variance between any matter in writing or in print produced in evidence, and the recital thereof upon the record.' So also in criminal cases, the statute 7 Geo. IV. c. 64, s. 19, authorizes the court, upon a dilatory plea by the defendant of misnomer, or of a want of addition, or of a wrong addition, to amend the indictment or information according to the truth, and then to proceed with the trial upon the merits of the case, as if no such dilatory plea had been pleaded.

It has been noticed above, that in one of the early statutes of Amendment (8 Henry VI. c. 12) indictments and criminal prosecutions are expressly excepted from its operation; and though there is no such exception in the other statutes of Amendment, or in the statutes of Jeofails, it was fully established by the general current of authorities, that notwithstanding those statutes, criminal pleadings stand upon the same principles with respect to amendment, as those to which all pleadings were subject at common law. With respect to indictments, it was formerly considered that, as they are found upon the oath of a jury, there would be a manifest impropriety in making any alteration without their consent; hence it became a common practice, which is continued to the present day, from very ancient times, to ask the grand jury formally, at the time of their returning their bills into court, whether they consent that the court shall amend matters of form in the bills they have found, altering no matter of substance without their privity. But it is believed that instances of such amendments are extremely rare, and are almost unknown in modern practice. It is now decided law, that criminal informations, which do not depend upon the oath of a jury, may be amended by the court at any time before trial; though this was considered, even so late as the time of Lord Holt, to be a very questionable point. A frequent failure of justice by means of minute objections was the consequence of this exclusion of criminal cases from the beneficial operation of the statutes, and became a great reproach to the administration of the criminal law: to remove this evil, a kind of general statute of Jeofails, applicable to criminal pleadings, was introduced in 1826, in order, as the preamble states, 'that the punishment of offenders might be less frequently intercepted in consequence of technical niceties.' This statute (7 Geo. IV. c. 64, s. 20) provides that no judgment upon any indictment or information, for any felony or misdemeanor, whether after verdict or outlawry, or by confession, default, or otherwise, shall be stayed or reversed for want of the averment of any matter unnecessary to be proved.' It then proceeds to specify a variety of defects, both of omission and imperfect statement, and enacts that an objection founded on the appearance of such defects upon the record shall not have the effect of staying or reversing the judgment of the court.

AMENDMENT, in parliamentary proceedings, is an alteration proposed to be made in the draught of any bill, or in the terms of any motion, under discussion. Although no member (except when the House is in committee) is allowed to speak more than once upon the same question, he may speak again upon the amendment, which is considered to be a new question. Sometimes an amendment is moved, the effect of which is entirely to reverse the sense of the original motion; but when this is the object, it is more usual to move a negative. It not unfrequently happens, however, that the amendment proposes to leave out all the words of the original motion except the word 'That,' with which it commenced, and to substitute others in their place. When a motion for the adjournment of the House is made, it is always in the words 'That the House do now adjourn;' and, if the motion be carried, the House will adjourn to the next sitting-day, unless a resolution shall have been come to in a previous part of the evening that at its rising it will adjourn to some other particular day. It is not competent, therefore, upon the motion for adjournment to move an amendment specifying any day to which the House shall adjourn. It was long a matter of dispute whether, when an amendment was proposed to a motion after the previous question had been also proposed, it was necessary to withdraw the previous question before the amendment could be put; but it was decided, by a vote of the House of Commons on the 16th March, 1778, that it was necessary first to withdraw the motion for the previous question. An amendment may be proposed upon an amendment, as well as upon an original motion. It is commonly said that the rule is, when an amendment has been proposed, that the amendment is first put to the vote and then the main question; but this, although the mode commonly observed at public meetings, is not exactly the practice of Parliament. There the general rule is, that the motion which has been first put and seconded, shall always be the first put from the chair; and, accordingly, when an amendment has been proposed, instead of the question that it shall be adopted being directly put, a vote is taken upon the question, 'That the words proposed to be left out stand part of the question.' If this motion is carried in the affirmative, the main question, which is really the same thing, is next put, and, of course, agreed to. But if the motion, 'That the words proposed to be left out stand part of the question,' is negatived, the words that were proposed in the amendment are substituted, as of course, and the main question thus altered is then put. So that, in point of fact, the amendment separately is never put at all.

When amendments are made in either House upon a bill which has passed the other, the bill, as amended, must be sent back to the other House. The rules of proceeding between the Houses in the case of such amendments, according to Mr. Hatsell, are as follows:—'1st. Either House disagreeing to amendments made by the other should assign reasons, and all reasons must be delivered at a conference; 2dly. If the reasons for disagreeing are held to be sufficient by the other House, that House answers by message that they do not insist; 3dly. If held insufficient, the House at a conference say, that they insist, or adhere, and give reasons for so doing.' It may be added, that the almost uniform practice in both Houses, when it is intended not to insist upon the amendments, has been to move affirmatively 'to insist,' and then to negative that question. (See Hatsell's *Precedents*, edit. 1818, vol. ii., pp. 106-135, and 186-207; and vol. iv., pp. 5-14, 44-47, and 242.)

AMENTA'CEÆ, a name sometimes given to a number of forest trees found chiefly in the north of Europe, Asia, and America; the flowers of which are arranged in a dense cylindrical deciduous spike, called by botanists an amentum. Such are the poplar, the birch, the hazel, the willow, the oak, and many others. But as their genera are in fact constructed in very different manners, amentaceæ are more correctly separated, by modern botanists, into several different orders, for which see CUPULIFERÆ, SALICINEÆ, BETULINEÆ, and PLATANEÆ. The term amentaceæ is, therefore, either to be considered abolished, or as a collective name of all these.

AMERCEMENT. Where courts of justice impose a pecuniary punishment on offenders, the sum awarded to be paid is termed a *fine*, or an *amercement*, according to the nature of the offence and the authority of the court. The difference between these is not merely nominal, though perhaps at the present day it is not of much practical importance. The remedy for the recovery of the amercement is by action, or by distress on the personal property of the offender; but for a fine, the law has provided a process for securing payment, by arresting the person of the delinquent.

Where the offence amounts to a breach of the peace, or to a contempt of the king's courts, or other similar misdemeanour, a fine is the ordinary punishment, the amount of which is in the sole discretion of the judge: where the offence is of a lighter character, or is the subject of a proceeding in certain inferior courts, the party is punished by being amerced, and is said to be *in misericordiâ*, or 'at the mercy of the court. In the latter case, the court has no further authority than to adjudge that *some* amercement shall be inflicted on the party; the *amount* of it is left to be assessed (or, in technical language, *affeered*) by persons whose character is analogous to that of a jury.

The following examples may be selected to illustrate this subject:—

The sum of money ordered by the superior judges to be paid by way of penalty for the commission of any criminal acts, of which an offender has been found guilty, is a *fine*, and is sometimes also called a *ransom*, because it is imposed in lieu of corporal punishment.

So where the defendant in a civil action had a verdict against him for the commission of a trespass, or any other civil injury accompanied by force or violence, the court usually awarded that he should pay a fine to the king over and above the damages which he was liable to pay to the injured party. But where there was a verdict in an action against the defendant for a breach of contract, or other similar injury wholly independent of any imaginable force or breach of the peace, the court awarded, and still awards, that he shall be *amerced*, (in addition to the usual judgments of damages, &c. payable to the plaintiff,) and the proper person to assess the amount is the coroner of the county in which the action is laid.

In all actions in which the plaintiff fails in establishing his right, a similar amercement is imposed on him as the penalty of his false claim; and this is in addition to the costs which he has to pay to the successful party.

It should be observed, however, that although the records of our legal proceedings still carry on their face the formal evidence of these antient usages, and the defeated plaintiff is to this day nominally amerced for his failure, and the unsuccessful defendant is still liable in many instances to be fined or amerced for his obstinate resistance to the plaintiff's just demand, yet in civil actions, neither fine nor amercement is ever in fact levied. In some cases, the legislature has abolished the practice; in others it has been effectually abrogated by desuetude, so that scarcely any other penal fines or amercements are now known in our courts, except those which are imposed in the execution of criminal justice.

The subject of amercements was formerly of sufficient importance to obtain a place in the provisions of the GREAT CHARTER, which enacts that they shall be equitably proportioned to the magnitude of the offence, and shall in no case be so excessive as to deprive the offender of the means of livelihood. It is by analogy to the case of amercement that fines, although not expressly named in Magna Charta, are deemed to be constitutionally within its spirit, so as to restrain within moderate and reasonable limits the discretion of the judges in imposing them. (See the *Bill of Rights*, 1 William and Mary; Bacon's *Abridgment, tit. Fines and Amercements;* Blackstone's *Com.*, book iv., chap. 29.)

AMERICA. The general description of this continent will be given under the following heads:—

I. Discovery.
II. Short notices of what coasts have been surveyed.
III. Its Physical Geography. *a.* North America; *b.* South America.
IV. Man.
V. Zoology of America.
VI. Botany of America.
VII. Chief Political Divisions and Foreign Settlements.

I. During the latter part of the fifteenth century there was an ardent spirit of discovery in Europe, the principal object of which was to find a passage by sea to the East Indies. The Cape de Verde Islands, the Azores, much of the Western coast of Africa, and the Cape of Good Hope, were successively discovered by the Portuguese, and the probability of reaching India by sea was gradually becoming stronger. The states of Venice and Genoa concentrated the commerce of Italy, but the overland trade with India was engrossed by Venice. In this state of things a project was formed by Christopher Colomb, or Columbus, a citizen of the rival state of Genoa, to sail westward to the Indies,—an idea which shows Columbus's knowledge of the figure of the earth to have been superior to the general notions of his age. He offered his services for this purpose to the governments of Genoa, France, England, and Portugal, by whom the proposal was successively rejected; but after eight years, his offer was accepted by Ferdinand and Isabella, king and queen of the united kingdoms of Castile and Aragon. The expenses of the expedition were defrayed by the crown of Castile, the property of Isabella, and it was to the influence of this princess that the furtherance of Columbus's views appears to have been mainly owing. The expedition, consisting of three vessels, sailed from Spain on the 3d of August, 1492; and on Friday, the 12th October following, an island was descried, upon which Columbus landed on the same day. The island was named by him San Salvador, and is now otherwise known as Guanahani, one of the Bahama islands. Columbus then visited other adjacent islands, and proceeded to Cuba and Hayti, to which latter he gave the name of Española. Here he left a few of his companions as the groundwork of a colony, and returned to Spain to procure reinforcements. The court was then at Barcelona, and the entrance of Columbus, with some of the natives, and the gold, the arms, and utensils, of the discovered islands, was a triumph at once more striking and more truly glorious than that of any conqueror. In this voyage he had acquired a general knowledge of the islands in the sea between North and South America, but he had no notion that there was an ocean between them and China; they were considered as part of India, from whence arose the appellation of West Indies, as well as that of Indians, which has ever since been given to the original inhabitants of the whole continent of America. The success of Columbus now rendered the court of Spain eager to forward his designs, and he sailed, on his second voyage for Española, with a fleet of seventeen sail, accompanied by several persons of rank and fortune. In this voyage the principal discovery was the island of Jamaica. Columbus was soon called back to Spain to answer accusations which had been made against him by his enemies. A third expedition followed, in which the island of Trinidad was found, and the admiral visited the mouth of the river Orinoco and landed on the coasts of South America which now form part of Columbia, before reaching Española. After having thus discovered the continent of America, and made settlements in the islands, it was the hard fate of Columbus to be sent home in irons and treated with indignity, owing to the machinations of his enemies. He, notwithstanding, undertook a fourth voyage, and returning to Spain, died at Valladolid in 1506, having had the glory of making one-half of the world known to the other—a glory untainted by cruelty or rapacity on his part, though the search of gold was pursued by the Spaniards with most unscrupulous avidity.

The success of Columbus soon gave encouragement to private adventurers to the new world, one of the first of whom was Alonzo de Ojeda, who, in 1499, followed the course of Columbus to the coast of Paria, and, standing to the west, ranged along a considerable extent of coast beyond that on which Columbus had touched, and thus ascertained that this country was part of the continent. Amerigo Vespucci, a Florentine gentleman, accompanied Ojeda in this voyage, and having had a chief share in the direction of it, and having published an account of it on his return, the country of which he was supposed to be the discoverer came gradually to be called by his name, and by universal usage the name of *America* has been bestowed on this new division of the globe. It is now too late to redress the injustice which has received the sanction of time.

The finding of a new world in the west was an event at once extraordinary and unexpected; it was accidental, because the object of Columbus was a western passage to India; nor are there any reasons for believing that the inhabitants of the old world had, at any previous time, the slightest approach to a knowledge of the western continent, unless the alleged discovery of Greenland, by the Norwegians, in the ninth century, be so considered. They had gradually reached the Shetland and Feroe Islands, and advanced to Iceland, in all which they had planted colonies, and they certainly arrived either at Greenland, or some other part of the high latitudes of the North American continent, and made settlements there also: but it does not appear that this gave the Europeans any notion or suspicion of the existence of a new continent stretching so far from north to south, and this Norwegian discovery is a very different thing from discovery in the southern latitudes. Part of Asia, Europe, and Africa constituted the earth known to the antients; to this world alone all antient traditions and writings have reference; and to it were confined all enterprises of gain or ambition, and all philosophical speculations. The discovery of America, therefore, was the opening of a new field to wealth, glory, and knowledge. Its influence upon the old world has been, perhaps, scarcely less important than that of the old world upon the new, and the memory of the immortal Columbus will be held in perpetual honour alike by the old continent which gave him birth, and by the new one, which ought to have borne his name. (See Robertson's *America*, and Washington Irving's *Columbus*.)

Although the island of St. Salvador was discovered, as already stated, in 1492, the existence of the continent of South America was not ascertained by Columbus until 30th May, 1498. Now, almost a year before, viz., on 24th June, 1497, the coast of North America had been reached by an English vessel, commanded by Giovanni Gaboto, or Cabot, a Venetian, settled in Bristol, who undertook an expedition in company with his son Sebastian, and explored a long line of the North American coast. (For the discoveries of the two Cabots, and as to their comparative agency, see the article CABOT.) In 1498, Sebastian Cabot, in another expedition, visited Newfoundland. In 1500, Gaspar Cortereal, a Portuguese, touched at Labrador; and Brazil was accidentally discovered by a Portuguese fleet under Cabral, which had been fitted out for purposes of trade and conquest in the East, in consequence of the success of Vasco de Gama, who had recently accomplished the passage to the East Indies by the Cape of Good Hope. (See AFRICA; GAMA.) The coast of the province of Tierra Firma, from

Cape de Vela to the Gulf of Darien, was first visited by Bastidas, a Spaniard, in 1501. Yucatan was discovered by Diaz de Solis and Pinzon in 1508, and Florida by Ponce de Leon in 1512. In the same year, Sebastian Cabot reached the bay, since called Hudson's Bay. The Pacific, or Southern Ocean, was first seen from the mountain tops near Panama, by Balboa, in 1513; and, two years after, a landing was effected on the south-east coast of South America, about the mouth of the Rio de la Plata, by De Solis, who, as well as several of his crew, was killed, roasted, and eaten by the natives. The Spanish government, which had been foremost in discovery, was the first also to make conquests in America, early in the sixteenth century. Fernando Cortez was dispatched to subdue Mexico, the most powerful state in the new continent, and very rich and extensive. Notwithstanding the efforts of its chief, Montezuma, it soon fell under the dominion of Spain, and this conquest was followed by another almost equally valuable—that of Peru, whose subjugation to the Spanish yoke was effected by Pizarro. The French now began to participate in the zeal for adventure, and in 1524, an expedition was dispatched by Francis I., under Giovanni Verazzano, a Florentine, who surveyed a line of coast of seven hundred leagues, comprising the United States and part of British America. But in 1508 Aubert, a Frenchman, had already discovered the St. Lawrence river. Jacques Cartier, also a Frenchman, in 1534, nearly circumnavigated Newfoundland, and entered the Gulf of St. Lawrence. In his second voyage, the next year, Cartier sailed up the St. Lawrence, to the habitation of Hochelagen, near the site of Montreal, and brought away a native king to France. The coast of California, on the west side of the northern division of the continent, was discovered by Ximenes, a pilot, who had murdered Mendoza, a captain, dispatched by Cortez on a voyage of discovery; the gulf of California, or sea of Cortez, was first entered by Francisco de Ulloa, another captain sent out by Cortez, in 1539. The Spaniards subsequently undertook several unsuccessful voyages, but they did not abandon their hopes, and at the close of the sixteenth century, Sebastian Viscaino advanced along the coast of New Albion as far as the Columbia River. During the reign of Henry VIII., attempts were made by the English to find the north-west passage to India, without success; and in the next reign, Sir Henry Willoughby failed in search of a north-east passage. Three successive voyages in search of the north-west passage were made in the next reign, by Martin Frobisher, who, in 1576, and the two following years, explored Labrador and Greenland, but without any further result. Among our early north-west voyages of discovery, may be mentioned those of Davis, in 1585; of Weymouth, in 1602; of Knight, in 1606; of Hudson, in 1610 (from whom is named the great inland sea called Hudson's Bay and the river of New York); of Button, in 1612; and of Bylot and Baffin, in 1615, from the latter of whom Baffin's Bay has been named. After this year, there seems a pause in the progress of northern discovery; but, in the mean time, colonization in North America had been begun by England. Sir Humphry Gilbert was the first to attempt it, though he merely took formal possession of Newfoundland, in 1583; his half-brother, the celebrated Sir Walter Raleigh, in 1584, dispatched an expedition which discovered the country then called Virginia, and he made several attempts to colonize it, without effect. The colonies of Virginia and New England were respectively planted in 1607 and 1620, under James I., and it is not a little remarkable that one hundred and six years elapsed after North America was first visited by Cabot, before a single Englishman had effectually settled in the country.

For the progress of discovery on the north-west shores of America, the English accounts of Cooke, Clarke, Meares, and Vancouver, and the narratives of the Russians, Behring and Tshirikow, may be referred to. The journey of Samuel Hearne, to the Copper-mine River, from Hudson's Bay to the Northern Ocean, in latitude 72°, which terminated in 1772, was important in showing the fallacy of the supposition that was entertained of the extension of the continent in an unbroken mass towards the Pole, Hearne having been the first to reach the shore of the Arctic Ocean. In 1793, Alexander Mackenzie reached the Arctic Ocean, latitude 69°, and in another expedition crossed to the Pacific by land, being the first person who had penetrated from sea to sea across the mass of the continent. After this, there was another pause in the annals of discovery, until, in 1818, the British government dispatched Captain Ross in search of the north-west passage, who entered Lancaster Sound, and reached latitude 78° north, but returned under circumstances of disappointment. In 1819, the Admiralty dispatched Lieutenant Parry in the same direction, and his success was so brilliant that he reached 30° of west longitude beyond any former navigator, discovered the North Georgian islands, and numerous new lands and bays, and completely established the fact of the existence of the Polar Sea. Captains Parry and Lyon undertook another voyage in 1821, and wintered in Melville Island, without further success. Captain Parry made a third expedition in 1824, wintering at Prince Regent's Inlet, but lost one of his ships, and was, upon the whole, unsuccessful. The land expedition of Lieutenant Franklin and Dr. Richardson, in 1820, to the Arctic Sea, and the second expedition in 1825, to the mouth of Mackenzie River, and thence by sea towards the north-west extremity of the continent, made some addition to our knowledge of the coast of this Polar Sea, and also extended our information as to the climate and productions of these Arctic regions. The object of Captain Beechey's voyage to Behring's Straits, in 1825, was to meet the expedition of Franklin, which was not effected; he returned without further discovery than the addition by survey of a new and extensive line of coast to the geography of the Polar Regions. It only remains to refer to the Polar voyages, particularly those of Scoresby, between 1806 and 1822, and that of Captain Parry in 1827, who reached the latitude of 82° 40″ north. The private expedition of Captain Ross left England in 1829, and has not been heard of since. All the discoveries, either in the Polar regions or towards the north-west, have been arrested in their progress by either fixed or moveable ice, and the question of the existence of the north-west passage is still unsettled. There is an account of a pretended voyage round the northern extremities, written by L. Ferrer Maldonado, and alleged to have been performed by himself in 1588, but it is considered unworthy of credit; the fact at present is that no one has ever sailed round America on the north, nor, if the passage were discovered, could it be of any commercial utility.

For an account of discoveries made by the Danes on the east coast of Greenland in 1829, see *Journal of the Royal Geographical Society*, for 1830-31.

II. The following are the parts of the American coast that have been surveyed.

The river and gulf of St. Lawrence are now in the course of being surveyed in a very elaborate manner by Captain Bayfield.

Newfoundland was surveyed by Cook, and the east side has since been accurately laid down by Captain Bullock.

Nova Scotia has been surveyed by Mr. Des Barres and Mr. Lockwood.

The West Indies are now in course of being surveyed by Captain R. Owen.

There has been no complete survey of the coast of the United States.

The survey of the coast of Brazil has been ably executed by Admiral Roussin.

The Rio de la Plata has been surveyed by sundry English officers, Heywood, Foster, &c.

The coast to the south of that river is now undergoing a survey by Captain Fitzroy.

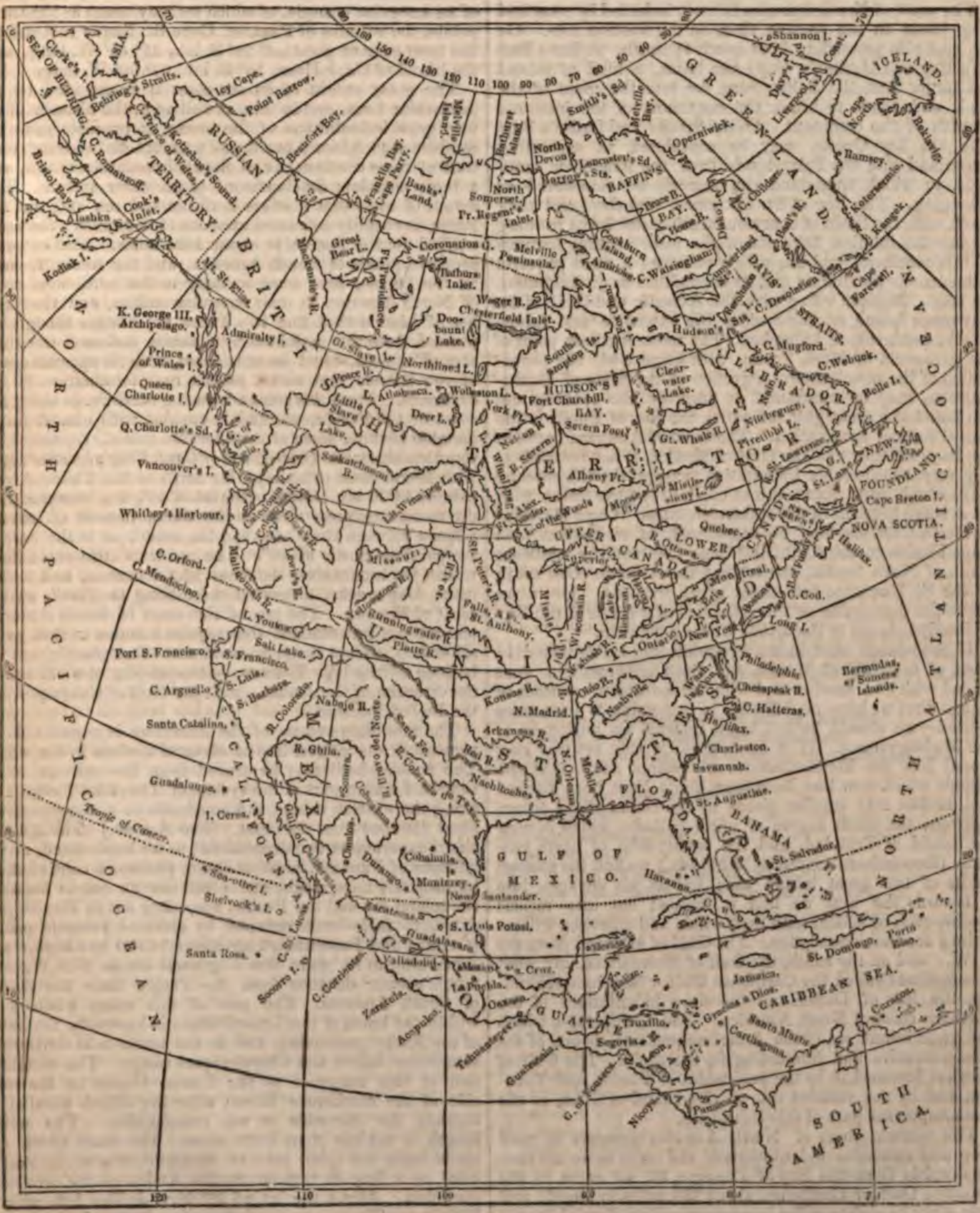
The coasts of the Tierra del Fuego, the Strait of Magalhaens, and the coasts of the continent north of the strait, on the east side as far as to about 50° S. lat., and on the west nearly up to 48° S., have been lately surveyed by Captain Philip Parker King.

The west coast, from the part opposite to the north of Mexico downwards, was all long ago surveyed by the Spaniards, but wants re-examining. Cook, in his third voyage, surveyed from Cape Gregory in 44° N. lat. to the Icy Cape, which he placed in 70° 44′ N. lat.; and Vancouver afterwards surveyed from 38° 15′ N. lat. to 45° 46′ N. lat.

The portion of Behring's Straits from 65° 50 N. lat. to 67° 5′ N. lat., including Kotzebue's Sound, was surveyed by Kotzebue; and Captain Beechey has since executed a more extensive survey of the same coast, beginning at Point Rodney in 64° 35′ N. lat., and terminating with Point Barrow (the farthest point seen) in 71° 25′ N. lat. and 156° 10′ W. long.

III. The external form of America presents, in many respects, a contrast to that of the old continent. Viewed as an entire region, it has a lengthened figure, of which the greater diameter is inclined to the equator: the whole continent is the longest continuous mass of land that the globe presents, stretching from the northern icy ocean into the cold regions of the south. This continent is composed of two great peninsulas united by a long isthmus, which, whether we consider its form, or the primitive rocks of which it is composed, bears no resemblance to the isthmus between Africa and Asia. The expression 'New Continent,' which is often applied to America, does not refer to the comparative ages of the two continents, or the time of their supposed appearance above the ocean, but to the chronological order of our knowledge.

The northern extremities of America, as already stated, have been but partially ascertained, and when we reflect on the nature of the Icy Sea, it is difficult to believe that navigators can ever explore its full extent. On the east, America is washed by the Atlantic, and on the west by the Pacific ocean. Its length from the northern latitude of 70° to 56° south latitude, may be considered as exceeding 9000 miles, though it cannot be accurately stated; its breadth upon an average is about 2000 miles; its widest part extends from about the 55th to the 168th degree of west longitude from Greenwich. The extent of surface has been variously stated. Hassel has given it at 17,303,000, and Balbi at 14,622,000 square miles, but in every estimate allowance must be made for the uncertainty of the northern limits, and our still imperfect acquaintance with the form and position of some coasts. Berghaus makes the area about 14,219,967 square miles, not reckoning the islands, to which he assigns an area of about 98,660 square miles, which is certainly too little. The most southern point is Cape Horn, near the island of Tierra del Fuego. The two great portions which are called North and South America are divided by the great mediterranean sea sometimes called the Columbian Archipelago, and united in 9° N. lat. by the isthmus of Panama, which in the narrowest place is not more than thirty miles wide. North America comprehends all that part of the New World which lies north of the isthmus of



Panama, and extends to the Polar Regions. Its eastern extremity on the coast of Labrador is in 55°, and its western, on Behring's Straits, in about 168° W. longitude.

a. The form of North America has sometimes been compared to that of a triangle, with the vertex terminating at the isthmus of Panama, and the base determined by the shores of the Frozen Ocean. It may be more to the purpose to remark that, as a general law, the breadth of the continent diminishes southwards to the isthmus of Panama from the latitude of 50° north. The extent of coast is very great, owing to its form: the length of coast from Hudson's Straits to the Florida Channel is about 4800 miles; and measured from the Florida Channel along the inland sea to Panama, about 4500. The whole length on the Pacific side to Behring's Straits (including the Gulf of California) has been roughly given at 10,500 miles. The extreme north and north-eastern coasts we do not attempt to give. The area of North America is stated to be rather greater than that of South America.

The coast of North America is more indented by seas and large inlets on the eastern than on the western side. On the east side proceeding from north to south, we have Baffin's Bay and Hudson's Bay; the latter, a kind of inland sea larger than the Baltic, runs far into the mass of the land, and tends to break the continuity of the immense breadth of the continent. Davis' Straits and Baffin's Bay, with the Icy Ocean, may be considered as separating Greenland and the Polar lands from the American continent, to which Greenland can scarcely be considered as belonging. The Bay of St. Lawrence, and the great river itself, with the chain of enormous fresh-water lakes running far into the interior, form one of the most striking features of this continent, and one which exercises a most powerful influence on its climate and its capabilities as an habitation for man. Hudson's Bay with the Atlantic and Gulf of St. Lawrence bound on three sides the extensive and inhospitable peninsula of Labrador. The most southern point of the peninsula of Nova Scotia, with Cape Cod, the termination of the most eastern projection of the State of Massachusetts, may be considered as marking the opening and the limits of a great gulf, of which the Bay of Fundy is the funnel-formed termination. The coast of America, between the Bay of Fundy and the Gulf of Mexico, is not marked by any very considerable indentation, except the Chesapeake Bay, which runs from south to north about 180 miles, with an average breadth of about thirteen miles. Cape Hatteras in North Carolina may be considered, in connection with Cape Florida to the south, and Cape Cod and the southern point of Nova Scotia, as dividing the Atlantic coast south of the St. Lawrence into three great divisions. The more particular description of the Atlantic coast south of the Bay of Fundy belongs to the article UNITED STATES.

If the islands that in an irregular line lie stretched in front of the Gulf of Mexico and the Caribbean Sea were united with one another and with the main land—a state of things that we have no difficulty in imagining to have once existed—we should have a large internal sea analogous to the Mediterranean. If it be doubted if this sea was ever closed like the Mediterranean, we cannot doubt that the islands which now line its eastern limits have been hacked and broken into smaller pieces by the action of the ocean. Between the tenth degree of north latitude, which is near the island of Trinidad, and the twenty-fifth of north latitude, (the southern extremity of Florida,) we find the eastern limits of this great inland sea; but as we advance into it towards the west we find it scooped out into various basins, each of which, with their winds and currents, will require a separate description. The Gulf of MEXICO is on the N.W.; and on the south, the Gulf of HONDURAS, and what is sometimes called the Caribbean Gulf or Sea, comprehending the Bay of Darien and the deep indentations of the northern coast of South America. The Archipelago, which the great inland sea of the Americas presents, is one of the most extensive and interesting in the world. The Gulf of Mexico, hemmed in by the peninsulas of Florida and Yucatan, and by the western side of the island of Cuba, is the most important part of this inland sea.

The western coast of North America presents no very deep and extensive indentations of the coast as we advance northwards from the Bay of Panama, till we come to the immense Gulf of California, about 800 miles in length, and from sixty to eighty miles in average width, formed by the main land and the long narrow peninsula of California. Between the latitudes of 47° and 60°, the west coast of North America is exceedingly irregular, presenting a great number of islands, some of considerable extent, and forming with the main land numerous bays and creeks. Farther north we find between Cook's Inlet and Prince William's Sound an extensive peninsula running about 200 miles from north-east to south-west; and west of this the still more remarkable long narrow peninsula of Alashka, or Alyaska, running in a similar direction for about double the distance. Both these peninsulas have steep rocky coasts lined with islands and rocks. The straits which take their name from the navigator Behring separate Asia from America by a comparatively narrow channel of about 48 miles in width.

Though the great mountain-chain which runs from the extremity of North to the extremity of South America, experiences two depressions or breaks at the isthmus of Panama, we cannot consider the two continental masses as separate in their character. They form one mass with many striking characteristics in common. South America has the form of an irregular triangle, of which we may name as the three points, the isthmus of Panama, Cape St. Roque (not strictly the most eastern point), 5° 28′ S. lat., 35° 40′ W. long., and the island of Cape Horn, 56° S. lat., 67° 20′ W. long.

The great extent of its sea-coast is determined by its peninsular form, and in this, as well as in the absence of all very great indentations of the ocean, it presents some resemblance to Africa; but it also presents the striking contrast of more continuous and elevated mountain-chains, and a more complete developement of its water system. The extent of coast that it offers to the inland sea and the Atlantic, is roughly estimated at about 10,000 miles: the coast washed by the Pacific is about 5800 miles. The extreme southern points of South America, and the southern coast on the Pacific, bear some analogy to the north-west coast of North America in their irregular outline, and the number of islands that line it. Tierra del Fuego, though separated from the mainland by a narrow and most irregular arm of the sea, must be considered, with its appendages of barren islands and rocks, as the real termination of the continent. From this point advancing northwards along the coast of the Pacific, we find it studded with almost innumerable islands, some of considerable extent, separated by countless channels. (See *Charts of Capt. King's late Surveys*.) This island coast extends as far north as the Chiloe Archipelago, 42° S. lat. South of the lat. of 40°, it is remarked that the mountains press close on the shore, instead of leaving a space between their base and the ocean, as is the case in the parallels north of 40°. The sea thus insinuates itself within the mountains, detaches island masses, and makes many deep creeks, somewhat resembling the *fjords* on the coast of Norway. The rest of the coast of South America presents no indentations that require a notice in this general sketch, except the great bend that takes place about the latitude of the lake Titicaca, corresponding to a change in the direction of the Andes; with the Gulf of Guayaquil and the Bay of Panama.

The mountain system of the Americas is remarkable for presenting the longest line of elevated surface in the world. The Andes which may be traced from the extreme rocky islands, forming part of the system of Tierra del Fuego, run along the western side of the continent at a comparatively short distance from the coast. [See ANDES.] Though this chain experiences two depressions, as we have stated, in the isthmus of Panama, another chain, perhaps a continuation, immediately rises again, and continues its course between the inland sea and the Pacific, spreading out in Mexico into extensive table-lands crowned by elevated volcanic peaks. (Orizaba and Popocatepetl are above 16,000 feet high,) and continuing in its main line a general course N.N.W., at a much greater distance from the Pacific than the Andes of South America. The part of this range when it is within the limits of the United State, is known by the name of the Rocky mountains, and in the north-west territory is sometimes called the Chippewayan range. The termination of this range is at the Frozen Ocean on the west side of the Mackenzie River; after the fiftieth parallel of latitude the elevation is not considerable. The whole length is not less than 8700 miles. The chain which extends from the table land of Mexico does not run northward in a line so regular as the Andes of the southern continent. About the lat. of 22° N. it divides into several branches. The most easterly branch, which is but of inconsiderable elevation, is in its northern course broken through by the Rio del Norte; it then takes a north-eastern direction, forming the northern part of the province of Texas: in this part of its course, it acts as the water-shed between the Sabine with other small rivers that enter the Gulf of Mexico, and the minor affluents of the Rio Roxo, (Red River,) a tributary to the Mississippi. This is the range of hills which crosses the Arkansas, and appears in the state of Missouri under the name of the Ozark mountains, running towards the confluence of the Missouri and Mississippi; and probably continued beyond them at a slight elevation towards lake Superior. The general direction of the Ozark corresponds to that of the Appalachian chain.

The main mass called the Sierra Madre, running north from the plateau of Guanaxuato to the high table-lands of New Mexico, spreads out to a great extent east and west, and contains several parallel chains of mountains, forming longitudinal valleys like that in which the Rio del Norte runs. This mountain system, in its further course, separates the basin of the great Missouri and its affluents from the waters that flow into the Gulf of California and the Pacific. Of these western streams, the almost unknown Rio Colorado, which enters the Bay of California, and the Oregon, or great Columbia River, are the chief. From the level of the Mississippi River, as we advance westward towards the great dividing line, the country rises in irregular terraces, and in planes of small inclinations, so that the main mass of the Rocky Mountains does not present to the spectator any remarkable features of grandeur, at least none corresponding to its actual elevation. But between 36° and 42°, there are several points of the Rocky Mountains always covered with snow, and the mean temperature of these elevated regions within the territory of the United States is very low. The Big Horn, Spanish Peak, and James' Peak are estimated to be about 11,000 feet above the level of the sea.

Of the connexion and character of the mountain-masses in North America, which lie west of the main mass, we have but very imperfect information. A western branch, sometimes called the Cordillera of Sonora, stretches from the plateau of Guanaxuato towards the northern point of the Gulf of California, about 33° N. lat. The long narrow peninsula of California has also a chain of hills or mountains, running through it in a north-west direction, and supposed to be attached to some point of the Sierra Madre. Some are of opinion that the mountains of the Sierra Madre terminate about latitude 33°, (though it is certain that even north of that point there is a high table-land,) and that the Rocky Mountains, in which the Oregon has its rise, are to be considered as a continuation of the Californian range. But it is, perhaps, more probable, that the range which is traversed by the Columbia River in the lower part of its course, is the continuation of the mountains of California. From the northern extremity of the Gulf of California to the termination of the coast at the Icy Sea, we are only imperfectly acquainted with these high lands that are often seen at no great distance from the shore, and sometimes rising up from it like Alpine masses. There is, probably, a continuous range from the mountains of California following the windings of the coast into the peninsula of Alyaska; which, in a proper point of view, will admit of a better comparison with the Andes than the chain of the Rocky Mountains. In some part of the north-west coast these Ocean Alps rise to the height of between 14,000 and 16,000 feet. Mount Fairweather and Mount Elias, near the parallel of 60° north, rise respectively to the height of 13,824 and 16,938 feet.

The mountain system of the eastern side of the North American continent, called the Appalachian, stretches from about the 34° of latitude northwards to the banks of the St. Lawrence. As far north as the Hudson, its direction is pretty nearly from S.W. to N.E. In its southern parts, in the states of Alabama and Tennessee, it is at its greatest distance from the Atlantic, but continually approaches nearer as it runs north, till it is traversed by the Hudson River, where it is also reached by the tide-water. Here it takes a turn more to the north through Vermont and New Hampshire; in which latter state it acquires its greatest elevation. In the White mountains of the state of New Hampshire, Mount Washington, about N. lat. 44° 15′, is 6200 feet high, though it does not appear to belong to the main branch, but looks rather like a detached group.

The Appalachian system, considered in its full extent, does not consist of a single chain, but we frequently find several chains running parallel to one another, and forming extensive longitudinal valleys such as that of Shenandoah in Virginia. [See APPALACHIAN MOUNTAINS.] This mountain system, which is about 1200 miles long, forms the most striking characteristic of the Atlantic portion of the United States, containing the sources of numerous rivers, which on the one side contribute their waters to the Mississippi, and on the other find their way to the Atlantic, sometimes breaking through the most eastern chains of the Appalachian system, by passages apparently rent in the mountains. Though the height of the range south of the Hudson is inconsiderable, rarely exceeding the elevation of 3000 feet, yet, from its continuity, and the surface which it covers, this mountain system is a most important element in the climatology of the United States. For a more detailed view of this portion of the continent, see APPALACHIAN MOUNTAINS and UNITED STATES.

The great valley of the Mississippi drains a surface perhaps inferior to that of no river on the globe. The sources of the main stream, the Missouri, are ascertained to be in the Rocky Mountains, about 44° N. lat.: but the Yellowstone, which is really the main branch of the Missouri, rises in 42° N. lat. The sources of the Mississippi, though an inferior stream, have not been ascertained till lately. Mr. Schoolcraft, in the year 1832, found that the Mississippi originates in a lake, at the elevation of about 1500 feet above the Atlantic, and computed to be 3160 miles from the ocean, following the windings of the stream. We are not able to state the latitude and longitude of the source.

To form a correct view of the character of the vast continent of North America, we must consider the chain of the Rocky Mountains as its chief axis. Sloping down from this range to the Pacific (at least within the limits of the United States), we find an extensive region drained by rivers that run into the great ocean. East of the Rocky Mountains lies the great central valley of the Mississippi, perhaps the largest, and certainly the most interesting valley in the world; its eastern boundary is the Appalachian mountain system, its southern boundary is the Gulf of Mexico, and its northern limit is the level of the great lakes. From the Rocky Mountains to the bed of the Mississippi we have a slope, which, as to length, bears a similar proportion to the height of the Rocky Mountains that the shorter slope from the Alleghany system to the Mississippi bears to the height of its mountains. The slope from the Appalachian to the Atlantic is, according to the same law, shorter than that from the Rocky Mountains to the Pacific. Thus we have three great water systems south of the line of the Canadian lakes.

On the Pacific, the chief rivers are the—

	Length in Miles.
Oregon, with numerous large branches . .	1000
The Rio Colorado	unknown

In the great central valley we have the great Missouri, with its affluent the Mississippi, and numerous other streams of great length:—

	Miles.
Missouri to its confluence with the Mississippi .	3000
Mississippi to its confluence with Missouri .	1200
Mississippi from the confluence of the Missouri to its mouth	1265
Entering on the west side—	
The Arkansas	2000
Rio Roxo (Red River)	1500
On the east—	
Ohio to the junction of the Mississippi . .	980
Missouri to the outlet in the Gulf of Mexico .	4265

These lengths are given according to Darby. It will be observed that the length of the Mississippi, as here given, falls very far short of what is stated above.

Such are a few of the mighty rivers that water this extensive valley, which presents perhaps one of the most striking features on the face of the earth. From north to south its length is not less than 1200 miles, stretching from regions of almost perpetual cold to the tropical warmth of Louisiana. We see from an American paper that the Missouri has been navigated this year (1833) by a steam-boat engaged in the north-western trade, from the mouth of the Yellow-stone River to St. Louis.

When America was discovered, one continuous forest spread from west to east, from the shores of the Atlantic over the Appalachian system, and descended into the valley of the Mississippi. From the Gulf of St. Lawrence and the region of the great lakes, this uninterrupted mass of vegetation reached to the shores of the Gulf of Mexico, and extended even west of the main stream of the Mississippi. 'This ocean of woods, still in the far greater part existing, may be considered as about 2000 miles in length, with a mean breadth of 1000, and comprising 2,000,000 of square miles, and limited either by the Atlantic Ocean, the Gulf of Mexico, or by naked interior plains.' (Darby's *View of the United States*, p. 357.) These naked interior plains are found west of the Mississippi on the high lands as we advance westward. Here we come to extensive steppes devoid of trees, parched in summer by scorching heat, and over which in winter the winds from the Rocky Mountains sweep with an intensity of cold almost beyond belief. The spacious and dry plains of the Texas and the upper regions of Arkansas present a character analogous to the high plateaus of the Asiatic continent, and here the white man adopts those pastoral habits which are the only mode of life suited to the regions which he occupies. Stretched along the base of the Rocky Mountains, with an average width of five or six hundred miles, we find a country, which is emphatically called the desert: a country lying between the Ozark Mountains, and the Rocky Mountains, as far north as 41° at least. The lower parts of the Mississippi valley with a portion towards the north, are still covered with a dense forest, spread interminably like an ocean.

The prairies of the Mississippi valley are found both on the east and west side of the channel of the river; prairies exist also in the State of Alabama. They are extensive, elevated, and generally irregular tracts, without trees, though sometimes capable of producing them, covered in the spring with countless flowers and long grass, and often possessing a deep rich soil. Sometimes on the west side of the Mississippi they exhibit on their surface a salt efflorescence; incrustations of pure salt, covering the ground like ice, are seen in the upper valley of the Canadian river, one of the tributaries of the great Arkansas.

The rivers that enter the Atlantic along the eastern slope of the Appalachian, though in themselves of great importance, are inconsiderable when compared with the great rivers of the Pacific slope, and those of the Mississippi valley. They will be found particularly described under their several heads.

The basin of the Mississippi which has been described as extending from the Gulf of Mexico to the neighbourhood of Lake Superior, has no mountain barrier on the north. But here we find a most striking phenomenon. From the western extremity of Lake Superior, (about 92° W. long.) one of whose tributaries interlocks its sources with a branch of the Mississippi, we have a series of enormous fresh-water lakes, Superior, Huron, Michigan, Erie, and Ontario, collectively covering a surface of about 73,000 square miles, a space equal to the area of Great Britain. These lakes have the outer margin of the basins in which they lie at no very great distance from their shores, as we may infer from the inconsiderable courses of the streams which they receive. Lake Superior is the highest of these inland seas, being 641 feet above the level of the Atlantic: Lakes Huron and Michigan form a separate and somewhat lower basin; Erie a third; and 333 feet below Erie lies Ontario, doubtless once at a much higher level than it now is. The great falls of Niagara in the narrow channel that connects lakes Erie and Ontario, show at once the great difference between the level of these two lakes. The course of the St. Lawrence, it has been remarked, from the eastern extremity of Ontario, has a singular conformity to that of the opposite Atlantic coast, having a general north-east direction. After its exit from Ontario it receives near Montreal the great river Uttawas from the north-west, and, increased by numerous smaller streams, enters the Atlantic by a wide bay. This river of lakes, which in many respects is the most interesting in the world, will require a separate notice. [See St. Lawrence.]

The upper branches of the Mississippi proper and the St Lawrence lakes are on a high level, but not in a region of mountains. North of the basin of the Canadian seas we find that the cold regions of the north-west territory have also their great rivers. The Portage de la Prairie, about 150 feet above the level of lakes Winnipeg and Superior, is a swampy district, which, at this point, forms the dividing line between the waters that flow to the St. Lawrence basin, and those that belong to the basin of Winnipeg, the receptacle of numerous streams. The southern branch of the Saskatchevan rises in the Rocky Mountains near the sources of a branch of the Columbia river and the Missouri, traverses 15° of longitude, and falls into the great lake Winnipeg, in 53° north lat.: this lake is connected with Hudson's Bay by the Severn and Port Nelson rivers. The course of the Saskatchevan, as far as Winnipeg, is at least 900 miles. In 56° 41′ N. lat. and 109° 52′ W. long. is Methy Portage, forming part of a range running south-west which separates the rivers flowing north from those that flow south or east. On the north side is a valley 1000 feet deep, and a water passage is open, with some interruptions, to the great lake Athabasca. The basin of the Mackenzie lies north of the Methy Portage. The Mackenzie is one of the large rivers of our globe; but such is the complicated water system of this region, with its endless lakes communicating with one another, that it is almost impossible to say what should be considered as the source of this river. If we consider the Athabasca river as its remote branch, the Mackenzie flows through about 16° of latitude into the Icy Ocean. The sources of the Peace river are much farther to the north; but if we follow this stream through the Slave Lake into the Mackenzie, we shall find the whole course of the stream as long as if we traced it from the more southern branch. East of the Mackenzie, and flowing into the Arctic Ocean, are the Copper-mine and Fish rivers. It is impossible not to recognize a curious resemblance in the water system of the southern and northern parts of North America. The elevated table-land in which the Mississippi and the affluents of Lake Superior rise, divides the continent east of the Rocky Mountains into two parts. The basin of Winnipeg may be considered as a continuation of that of St. Lawrence, or as part of one high plateau, divided into two portions. Down the southern slope, the Mississippi flows to the warm regions of the Gulf of Mexico; and down the northern, the rival river Mackenzie runs into the Icy Ocean. The St. Lawrence and the large streams that enter the west side of Hudson's Bay are the great channels that carry off the collected waters of this elevated region of lakes into the Atlantic. But the peculiar nature of this north-west territory, and infinite assemblage of fresh-water basins, will be the subject of a separate discussion. It may be well to observe, that, independent of geographical position and the consequent difference of climate, the numerous lakes that belong to the northern portion of this continent and to the system of the St. Lawrence give it a peculiar character.

As it is our intention to devote a special article to the Canadian Seas, the N.W. Territory, and the United States, it is the less necessary here to enter into more minute details. Nor do we propose to discuss the subject of the climate of this continent further at present than by a few general remarks, and by referring to page 445 of this article, on the Botany of America.

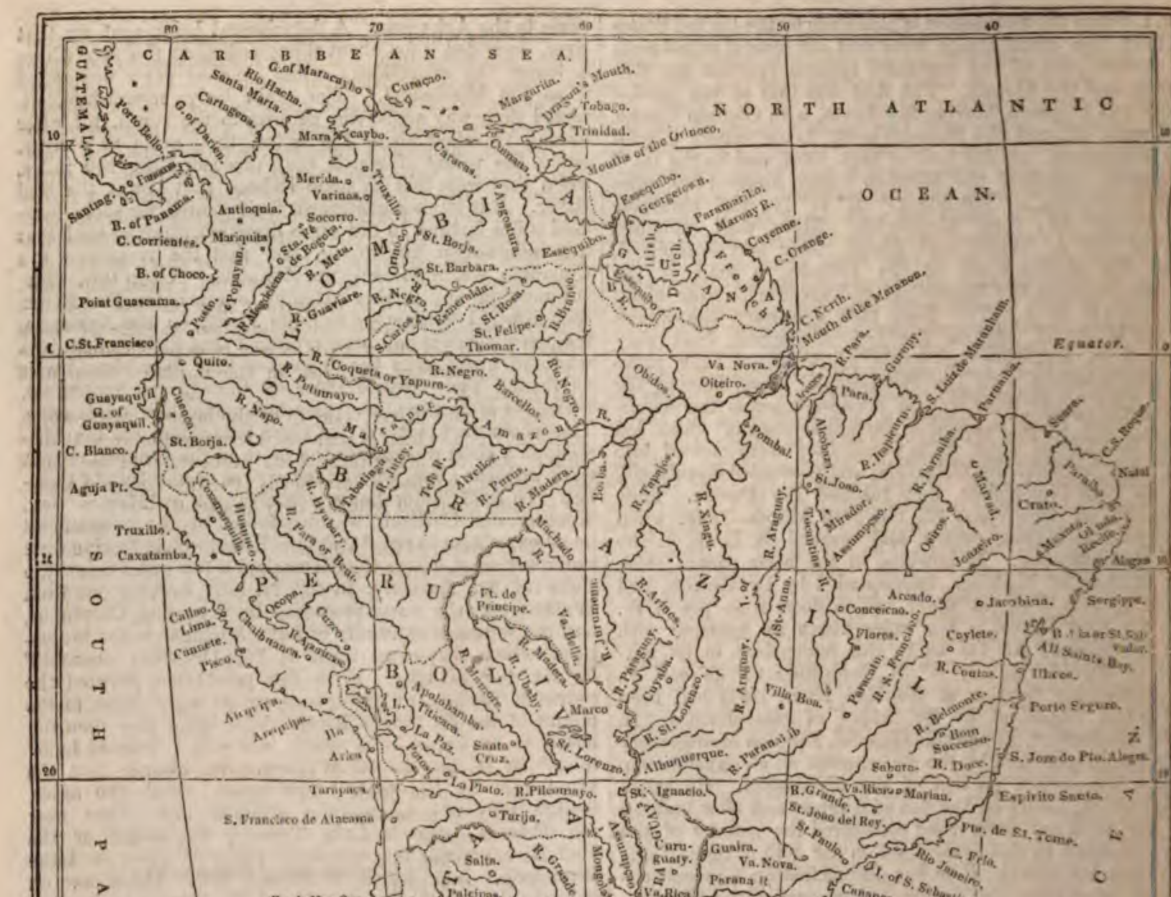
It is a fact, well ascertained, that the average temperature on the west coast of North America is higher than on the eastern. In the Oregon valley it is said to be higher than in corresponding latitudes on the Atlantic coast, by an amount equivalent to five or six degrees of latitude; and the winters are also much moister. The general nature of the climate of the American continent may be best understood by what is now known of the United States and the Canadas. The North-West territory, east of the Rocky Mountains, is a cold and inhospitable region, not adapted for the residence of agriculturists. On the eastern part of the continent agriculture has not advanced farther than the latitude of 51° or 52°. But the limit of successful cultivation, at the present day, must not be taken as the limit which cannot be passed. The cold within the United States increases as we advance westward on the same parallel, and this is independent of elevation, as we see from comparing the temperature of corresponding points on the Mississippi and the Atlantic, and as we infer from vegetable productions succeeding in a higher latitude on the Atlantic coast than in the basin of the Mississippi. The ponds of New Orleans have been frozen so as to allow half-grown boys to skate or play on them; a phænomenon that never occurred in the same latitude on the Atlantic coast. The discussion of the climate of the United States, which comprehends so large a portion of the habitable northern part of the New World, will be sufficient to show the general character of the climate of North America. We therefore refer to the article United States of North America, and to Darby's excellent work, entitled *a View of the United States*, &c., Philadelphia, 1828.

a. 1. Since the acquisition of Louisiana by the United States in 1803, the government have sent out several expeditions to explore part of the extensive regions between the Mississippi and the Ocean. The first was that at the head of which was Captain Meriwether Lewis, with Captain Clarke. The party entered the Missouri at St. Louis, where it joins the Mississippi, on the 14th of May, 1804, and by the 1st of November reached the Mandan towns, above 1600 miles from St. Louis, in latitude 47° 21′ 47″ N., and longitude 99° 24′ 45″ W. from Greenwich. Here they remained till the 7th of April, and during their stay completed, from the information of the Indians, a map of the country between the Mississippi and the Pacific from about latitude 34° to 54° N. They then continued the ascent of the Missouri, till, on the 18th of August, 1805, they reached its extreme navigable point, about 2500 miles from its junction with the Mississippi. Here, leaving the river, they made their way on horseback across the mountains, when they reached a navigable stream, which led them into Lewis river, from which they were carried into the main branch, the Columbia, and proceeded down it till, on the 15th November, they reached the Pacific. They remained on this coast till the 27th March, 1806, when they set out on their return, and reached St. Louis on the 23d of September. Meanwhile, in the latter part of 1804, Mr. Dunbar, of Natchez, accompanied by Dr. Hunter, had sailed up the Washita River, which flows from the N.W. into the Red River, a few miles above its junction with the Mississippi, as far as to the hot-springs in its vicinity, in latitude 34° 31′ 4″ N., longitude 92° 50′ 45″ W. A considerable portion of the Red River itself had been before this explored by Dr. Sibley, of Natchitoches. In 1805, Lieutenant, afterwards General, Zebulon Montgomery Pike was despatched by the government on an expedition to explore the upper portion of the Mississippi. He sailed from Port St. Louis on the 9th of August, and after making his way to what were then considered the sources of the river, returned to the same place on the 30th of April, 1806. Soon after his return, Pike was despatched on a second expedition, to explore the country to the south of the Missouri. He left St. Louis on the 15th of July, 1806, and having proceeded up the Missouri till he came to its junction with the Great Osage River, he entered the latter, and explored it nearly to its source. The course of the Great Osage had been before this very imperfectly known. He then crossed the country to the Arkansas, which he explored from about latitude 35° to its source in latitude 42° N., a portion of which no account had been previously given. The lower part of the Arkansas was, at the same time, explored by a detachment from the main party, conducted by Lieutenant Wilkinson. After leaving the Arkansas, Pike continued his progress to the westward till he came upon the Rio del Norte, in New Mexico, where he was taken prisoner by the Spaniards, and detained for some months. He was, however, at length released, and effected his return to St. Louis by the 1st of July, 1807. In the course of this expedition, besides the results we have already mentioned, the sources of the River Platte, which falls into the Missouri, were discovered, a part of the River Kansas and the Platte was explored, and the general course of the Rio del Norte was ascertained.

In 1819, another expedition was sent out in the same direction, under the conduct of Major Long. This gentleman and his party left Pittsburgh, in Pennsylvania, on the 5th of May, and sailing down the Ohio to its junction with the Mississippi, ascended the latter river as far as St. Louis. They then proceeded along the north side of the valley of the Missouri to Council Bluffs, a position on the Missouri, above the junction of the Platte; here they established their head-quarters, and examined a considerable part of the surrounding country. A detachment was also sent across to Fort Osage and the Konzas village, farther to the south. Another detachment having returned down the Missouri to St. Louis, then ascended the Mississippi as far as to the Des Moines, or De Moyen Rapids, in lat. 40° 20′ N.

Meanwhile the main body, proceeding to the west, reached the Pawnee villages on the Loup Fork, a branch of the Platte, from whence directing their route to the south they came upon the Platte, and followed it westward till their further progress was stopped by the Rocky Mountains (about long. 104 W.) from whence it issues. They then took their way in a southerly direction along the base of the mountains, only occasionally ascending the peaks, till they came to the Arkansas. A detachment being sent up that river, ascended it for about thirty miles, to the spot where it leaves the mountains: while another party descended it to the Mississippi. The main body, meanwhile, directed their way across the country to the south, till, after having travelled about 150 miles, they came to a river, along the valley of which they proceeded for 200 miles, when they were told by some Indians that it was the Red River. But having continued their course for some hundred miles farther in the same direction, they learned that this information was wrong, and that the river was the Canadian, which falls into the Arkansas. Upon this, without making any further attempt to reach the Red River they directed their steps to Belle Point, on the Arkansas, the place where it had been arranged that their companions who had undertaken the descent of that river should wait for them. They arrived there on the 13th of September, four days after the other party had made their appearance. The whole then set out for Cape Girardeau, on the Mississippi, a short distance to the north of the junction of that river with the Ohio, where they arrived on the 10th of October. In 1823 Major Long, accompanied by Messrs. Say, Keating, and Calhoun, was dispatched by the government on an expedition to the St. Peter's River, which, flowing from the north-west, enters the Mississippi a few miles below the Falls of St. Anthony, in 45° N. lat. Setting out from Washington, the party proceeded by Wheeling, Columbus, and the southern extremity of Lake Michigan to the Mississippi, which they came upon at Fort Crawford, about 43° N. lat. 91° W. long. From this point they pursued the course of the stream upwards along its right bank to the mouth of the St. Peter's River, which latter they then followed to its source in a small lake called Polecat Lake in 45° 40′ N. lat. 96° 36′ W. long.; the distance from the Mississippi by the route taken being about 500 miles though only 275 miles in a straight line. Very near the Polecat Lake is Lake Travers, the source of the Red River, which the travellers followed down to Lake Winnepeg, into which it flows. Fort Alexander on this lake, in 50° 46′ N. lat. 96° 25′ W. long., was the ultimate limit to which their journey extended. From this point they returned by the Lake of the Woods and Rainy Lake to Fort William on Lake Superior—thence round by the northern border of that lake to its junction with Lake Huron—across the Huron to its south-eastern extremity—and finally, round the west end and along the south-eastern coast of Lake Erie to the Falls of Niagara. The extent of the whole region traversed, or respecting which information was obtained, might be about 1300 miles from E.S.E. to W.N.W., and its average breadth about 450 miles. (See *Discoveries made in exploring the Missouri, Red River, and Washita*, by Captains Lewis and Clarke, Doctor Sibley, and William Dunbar, Esq., 8vo, Natchez, 1806; *Travels to the Source of the Missouri, in* 1804, 1805, *and* 1806, by Captains Lewis and Clarke, 4to., Lond., 1814; *Exploratory Travels through the Western Territories of North America; comprising a Voyage from St. Louis on the Mississippi to the Source of the River, and a Journey through the interior of Louisiana and the North-Eastern Provinces of New Spain, performed in* 1805, 1806, *and* 1807, by order of the Government, by Zebulon Montgomery Pike, Major, 4to., Lond., 1811: *Major S. H. Long's Expedition from Pittsburgh to the Rocky Mountains, in* 1819 *and* 1820, by Edwin James, 3 vols. 8vo., Lond., 1823; and *Narrative of an Expedition to the Source of St. Peter's River, Lake Winnepeck, &c., compiled from the Notes of Major Long*, by W. H. Keating, 2 vols. 8vo. Lond. 1825.)

To these successive expeditions sent out by the government of the United States to the more remote parts of its extensive territory, is to be added that in which Captain Back is at present engaged for the exploration of part of the northern extremity of the continent. The latest intelligence that has been received of this expedition is, that on the 10th of July Captain Back and his party were found by Mr. Simpson, the governor of the Hudson's Bay Company, in excellent health and spirits, at Fort Alexander, a trading station of the Company, on Lake Ouinipigue, (or Winnipeg,) not far from the Red River settlement on the Asseniboin. Here he had been waiting from the 6th for Mr. Simpson, who furnished him with an order on the Company's establishments along the whole line of communication to the Great Slave Lake, for whatever he might want during three years.



[South America.]

b. The Andes, as we have already remarked, is the great mountain-system of South America, presenting the longest unbroken range of lofty summits on the globe. Its description will be found under the article ANDES. There is a certain analogy between North and South America as to its mountain-chains. The axis of the two continents, in each case, approaches the western shore much more closely than the eastern, though, as already observed, the Rocky Mountains, which are the true axis of the North American continent, are far removed from the Pacific, compared with the chain of the Andes. The consequence of this is, that North America possesses an extensive water-system on the Pacific slope, including the great Colorado, the Columbia, and other large rivers; but no considerable stream from the Andes enters the western ocean.

The Rio de la Plata flows in a great central valley, running from north to south, which may be compared with the valley of the Mississippi, while the Amazon is the great drain of the low lands that stretch from the Andes to the Atlantic, and may be compared with the St. Lawrence of

North America. Besides the offsets that shoot out from the Andes, we find in South America several distinct mountain-systems. That which runs along the coast of Venezuela is, however, an offset from the eastern Cordillera of Cundinamarca, which runs down to the Caribbean Sea along the east side of the Lake of Maracaibo. From this system the Venezuela chain strikes off at right angles, in two parallel chains, running due east, of which the northern keeps close to the sea, and may be traced into the Island of Trinidad over the strait called the Dragon's Mouth. The highest point of this chain is the Silla de Caracas, which has an elevation of about 8000 feet. Besides this northern chain, which runs along the Island of Trinidad, terminating in Point Galera on the north-east shore, we find a chain parallel to it running along the southern shore of this singularly formed island; both these chains are undoubted prolongations of the Venezuela system. In consequence of this conformation of the northern coast, no great river enters the Atlantic, between the mouth of the Magdalena and that of the Orinoco. The Magdalena rises in the Andes at the point where the mountains divide into three branches, and like its affluent, the Cauca, runs in a longitudinal valley through at least 9° of latitude into the Caribbean Sea. Its course and outlet have a strong analogy to that of the Mackenzie River in North America. The high land of Guiana, or Parima, lies between the lower waters of the Orinoco and the Amazon, and forms, with the high lands of Venezuela and the Andes, the boundary of that immense plain which is drained by the Orinoco. This mountain-system of Parima runs from east to west, perhaps for 600 miles: it consists apparently of several parallel chains, some of which, in British Guiana, are said to rise to the height of 4000 feet. Numerous streams descend from these mountains to the ocean, one of which, the Essequibo, might be considered a large river in any other part of the world. Its numerous tributaries, which descend from remote parts of Guiana, run through almost impervious tropical forests, and, uniting in one main channel, enter the sea in about 7° N. lat. The high lands of Brazil lie on the east side of the continent, between the Amazon River and the Rio de la Plata. In their position, and their relation to the great basins of the continent, they present a most striking analogy to the Appalachian system of Northern America. Between the Andes and the high lands of Brazil lies the extensive plain drained by the Plata; and between the mountains of Guiana and those of Brazil, lies spread the immense level that belongs to the lower course of the Amazon.

The main mountain-mass of the Brazilian system lies between 18° and 28° S. lat., and consists of several parallel chains with a length of about 700, and a breadth of 400 miles. The *Sierra* nearest the sea is called the *Sierra do Mar;* next to this, and joining on to the Sierra do Mar in about 22° 30′ S. lat., we find the central chain, which, running as far north as about 16° S. lat., contains the highest points of the Brazilian system; some of these have probably an elevation of 5000 feet. This chain is continued at a smaller elevation up to 10° S. lat. The western chain, which is of small elevation, separates the affluents of the Parana and Francesco from those of the Araguay and Tocantin, which unite to form the Para. It does not appear that any mountain-system stretches across, and connects these high lands of Brazil with the Andes, and consequently the waters of the Paraguay are separated from the southern tributaries of the great Amazon by a water-shed of no great elevation. In no part of the world do we find three such basins as those of the Orinoco, Amazon, and La Plata, separated by such slight elevations. The mountains of Guiana, indeed, hardly can be said to separate the Amazon and Orinoco: they form an almost insulated mass, and only fill up the space between the lower courses of the two rivers, while the small difference between the levels of the upper parts of these streams is shown by the Cassiquiari channel which connects the Rio Negro, one of the large affluents of the Amazon, with the Orinoco. From the basin of the Amazon to that of the La Plata, it is not probable that the ascent is greater than from the upper waters of the Mississippi to the level of the Canadian sea.

Between the Amazon and the Plata, we find no rivers entering the Atlantic of any very considerable size, except the Parnaiba and Francesco. The Francesco runs in a longitudinal valley parallel to the mountains and the sea, for the greatest part of its course: it then turns to the E. and S. E., and enters the Atlantic. The rest of the Brazilian streams that flow to the Atlantic present, in their course and magnitude, a striking resemblance to the Atlantic waters of the Appalachian system.

The Orinoco is navigable upwards from its mouth, with only one interruption of rapids, for about 1000 miles: the Amazon is navigable for above 2000 miles; and the Paraguay, which is navigable through 19° of latitude, (from its confluence with the Jauru, 16° 20′ S. lat., to Buenos Ayres, where the name of Plata prevails,) is said to be separated from the Guapore (a feeder of the Madeira, which is a branch of the great Amazon) by a portage of only three miles, on a level whose height, it is said, does not exceed 2500 feet, and we are inclined to conjecture may be less. Such a natural system of water-communication, capable of being turned to the benefit of man, certainly exists nowhere else in the world, except, perhaps, in the northern division of the continent.

The Amazon River, said to be the largest in the world, and the Plata, which is scarcely inferior in the area that it drains and the magnitude of its affluents, will be found described under their several heads: the following statement, as to their supposed lengths, may be useful:—

		Miles.
The length of the Amazon		3300
Its tributaries, viz.,		
Ucayali		1350
Yutai		750
Jaura		750
Madeira		1800
Topayos		1000
Xingu		1080
Napo		800
Rio Negro		1400
The Parana, or Rio de la Plata, the second in magnitude		2130
Its tributaries, viz.,		
Paraguay		1200
Pilcomay	tributaries of the preceding	1020
Vermejoo		660
Salado		750
Uraguay		660
The Magdalena, discharging itself into the Caribbean Sea		750
The Orinoco		1440
The Essequibo		400
The Tocantin, or river of Gran Para		1500
The Parnaiba		700
The San Francesco		1275
The Cusu Levon, or Negro		540
The Moyale Levon, or Colorado		1080

The South American lakes are not numerous; and being, in many cases, caused by the overflowing of the immense rivers, they appear in the rainy season, and are dry in the summer. The Lake of Maracaibo, into which the waters of the Gulf of Venezuela enter at high tides, is 120 miles long, and 90 wide. The Lake of Titicaca, situated high in the Andes of Peru, receives the waters of numerous streams, but has no visible outlet. Salt lakes and salt streams are occasionally found; as for instance, on the route from Buenos Ayres through the great plain to Mendoza. (See Caldcleugh's *South America*, vol. i. p. 279.) There are also many lakes of no very great dimensions in Chili, and parts of the Andes system.

South America presents the most striking contrasts of lofty mountains and extensive plains in the whole world. It exhibits also a no less remarkable variety of climate from the summit of its snow-clad mountains to the low burning level of its interminable plains; from the woodless plateaus of Quito and Potosi, where the moderate temperature and even the cold of a northern climate are felt at elevations ranging from 8000 to 12,000 feet above the level of the sea, to the low flats of the Orinoco, the Essequibo, and the Amazon, covered with forests which almost exclude the light of day, adorned with all the magnificent foliage of a tropical climate, and swarming with almost endless forms of animal life.

The great plains, called in the native language *Pampas*, and by the Spaniards *Llanos* (levels), may be, in some respects, compared with the prairies of the northern continent and the high levels of the Arkansas. The immense plain which stretches N. W. of the town of Buenos Ayres, and runs south into the unexplored regions of Patagonia, appears to the eye like one dead level, without wood, without a stone, almost without water, in parts covered, during summer, with thistles taller than a man, in other parts clothed with rich grass, which furnishes food for innumerable herds of wild cattle. The enormous pampas of Patagonia, Buenos Ayres, and the more northern province of Tucuman, have been stated, at a guess, to be four times the area of France; and, perhaps, the estimate is not excessive. From the mouth of the Rio de la Plata, the continent of America narrows southward through 20° of latitude, the greater part of it being a country yet little known to Europeans. From about 40° of S. latitude, the country called Patagonia commences on the east coast: though not without some rivers, it appears to have none that run far into the interior; and it is hardly probable that it will offer many inducements for the white man to attempt to establish himself among a warlike race, whose climate and whose soil afford no great encouragement to European settlement. This mighty peninsula of South America, whose northern limits are warmed by the perpetual heats of the tropics, terminates, like the northern portion of the continent, though in a much lower latitude, in a region generally represented as cold and barren. In summer, however, when the north winds blow, the temperature of the island of Tierra del Fuego is moderate; and in some parts of the Straits of Magalhaens vegetation is very active. The Fuchsia and Veronica were found growing in the straits, in the lat. 54° south, 'and in full flower within a very short distance of the base of a mountain, covered for two-thirds down with snow, and with the temperature at 36°.' (Captain King.) But the winds from the south sometimes bring cold even in summer, and the highest mountains, though not more than four or five thousand feet above the sea-level, are covered with snow in summer. A race of men inhabits the islands of Tierra del Fuego, different from those of the higher continent, whose place in the scale of intellectual power is somewhat analogous to the ungenial nature of the southern parts of their islands.

It appears from Captain King's brief remarks on the geography of the Patagonian regions, (*Journal Lond. Geog. Soc.*,) that the immense pampas of Buenos Ayres probably extend south to the eastern banks of the Ancon sin Salida, and the northern shores of the Otway and Skyring waters. For *east* of the Ancon sin Salida, and *north* of the Skyring and Otway waters, no hills are seen; the general nature of the Patagonian coast, from the Rio de la Plata to the entrance of Magalhaen's Strait, is comparatively low, and, as far as we know, it bears the general character of the pampas. It is then probable, that from the wide levels of the Orinoco to the Otway water, a man might travel without crossing a single *mountain*.

The phenomenon of earthquakes is now exhibited in South America with more activity than in any other quarter of the world; nor is North America free from them, though their sphere of action appears to be, perhaps, more limited, and their effects less terrible. The great earthquake which, on March 26, 1812, laid Caracas and La Guayra in ruins, was felt near New Madrid on the Mississippi, where its effects were only less disastrous because the place was less populous. The forest near New Madrid presented, for some years afterwards, 'a singular scene of confusion; the trees standing inclined in every direction, and many having their trunks and branches broken.' (Long's *Exped. to the Rocky Mountains*, iii., p. 184.) These concussions, which are very common about New Madrid, are felt, it is said, from New Orleans to the mouth of the Missouri, and from the settlements on the Red River and the Washita to the Falls of Ohio. They are felt also in the Appalachian system and on the Atlantic slope, though we know of no instance in which any damage has been done. But in South America, earthquakes are matters of ordinary occurrence, though, we believe, they are always within the more immediate sphere of the greater Cordilleras and the detached branch along the northern coast of Venezuela. On the eastern coast of America they seldom occur. It is asserted, that where thunder and lightning are common in South America, as at Potosi, earthquakes are unknown; while at Lima, where thunder and lightning seldom occur, earthquakes are an ordinary occurrence. Whether this generalization is really a safe one may perhaps be doubted, till it is confirmed by further observation.

The climate of South America necessarily varies with the extent of latitude which the continent traverses. The latitude, however, is only one of the causes of the variations of temperature. The extensive and lofty mountain-chain, the highest peaks of which are covered with eternal snow, and the great height of the plateaus, added to the steep descents and great depths of the valleys that belong to the system of the Andes, necessarily produce a great variety of temperature within small distances. The Andes have a curious effect on the distribution of rain in South America. The wide plains on the east are deluged, within the tropics, by the heavy periodical rains from November to May, but the narrow margin between the Cordilleras and the Pacific is almost entirely without rain, at least within the tropics. It is said, however, that this phenomenon is confined to those parts where the mountains come near to the Ocean. In Chili, the north-west winds bring abundance of rain. As to temperature, that of Caracas is in winter, maximum of Fahrenheit 76°, minimum 52°; in summer, maximum 85°, minimum 69°. Chili, also, though bordering upon the torrid zone, never feels the extremity of heat. At Lima, the thermometer varies from 61° to 84°. On the eastern parts of the continent, viz., Buenos Ayres and Monte Video, the weather is wetter, and in the winter months is often boisterous and the air cool, whilst in summer the heat is very great and the thunder-storms often tremendous. The mean temperature of Tierra del Fuego, for the autumnal period of February, March, and April, is 47°; and for the three following months, the winter period, it is 34°. The extensive pampas produce in the dry season an effect not unlike that of the kamsin in the arid regions of Africa and the Arabian desert. In St. Jago del Estero, in the province of the same name, a hot wind has been felt in the summer month of December, which blisters the skin and face, scorches the leaves, and shrivels the bark of trees. (See Temple's *Travels in Peru*, ii., p. 484.)

b. 1. Much new information respecting parts both of the western coast and of the interior of South America, was obtained about the middle of the last century, from the expeditions sent out thither by France and Spain to measure an arc of the meridian. The French expedition was put under the command of Godin, Bouguer, and De la Condamine; and the Spanish, which was to co-operate with it, under that of Don Jorge Juan, and Don Antonio de Ulloa. Both left Europe in the spring of 1735, and the two parties met, as had been arranged, at Carthagena in the course of the summer. It was nearly ten years before their return home; soon after which, ample accounts of their operations and of all they had seen and learned were published in Spanish by Ulloa, and in French both by Bouguer and De la Condamine. Ulloa's book has been translated into English, and the third edition was published at London in 2 vols., 8vo., in 1772, with additions by Mr. John Adams of Waltham Abbey, who had resided many years in South America. It was by far the fullest account of the Province of Quito and the neighbouring districts which had then appeared. Ulloa and his companions had visited in person nearly every part of that province; and they had, besides, been exceedingly industrious in collecting information from all who had any to give. Ulloa, besides crossing the isthmus of Panama, and exploring the greater part of the coast from Panama down to Conception, in Chili, had repeatedly made the journey from Guayaquil to Quito, and had traversed in various directions a great part of the country to the south and north-east of that town.

De la Condamine published the account of the adventures of himself and his associates, first under the title of *Relation Abrégée d'un Voyage fait dans l'Intérieur de l'Amérique Méridionale*, 8vo., Paris, 1745, being the report read before the Academy of Sciences; and afterwards more at length under the title of *Journal du Voyage fait par Ordre du Roi à l'Equateur*, 4to., Paris, 1751. Prefixed to the last-mentioned work is a map of Quito on a large scale, drawn by D'Anville under the direction of the author. In addition to much information respecting the interior of the province of Quito, the French academicians brought home the first complete account that had been given of the course of the Amazons, which they had descended from Quebrada de Chuchunga to its mouth, a distance of a thousand leagues. They ascertained in particular that this river was connected with the Orinoco by the Rio Negro, one of its large northern affluents, a fact which, till then, had been doubted or denied.

But the geography of the upper regions of these two rivers has been recently more completely elucidated by Humboldt and Bonpland, whose examination of this part of South America began in 1799, and did not terminate till 1804. In these five years, after having examined the coast from Cumana to Caraccas, and made various excursions in the neighbourhood of both towns, they penetrated across the great plains to the Rio Apure, down which they sailed to its junction with the Orinoco. They then ascended the Orinoco by its principal branch till they reached the village of San Fernando de Atabipo, at its confluence with the Atabipo and the Guaviare, near lat. 4° N. From this point they sailed up the Atabipo to the mouth of the Rio Temi, which latter they ascended as far as to its junction with the Tuamini, and then to the village of San Antonio de Javita. Here they were detained for some days till their boat was carried across the land to the Pimichin, a tributary of the Rio Negro. Entering the Pimichin, they descended it till it brought them into the Rio Negro, down which they sailed till they reached the mission of San Carlos, a short distance below the mouth of the Cassiquiari channel, by which the Orinoco communicates with the Rio Negro, and through that, as has just been mentioned, with the Amazons. They afterwards returned up the river to the mouth of the Cassiquiari, along which they proceeded to the point of its junction with the Orinoco at Esmeralda, having for the first time completely traced the connexion between the Amazons and the latter. From Esmeralda they sailed down the Orinoco to Angostura, thus retracing part of their former voyage, but also following the river over a much larger portion of its course. From Angostura they proceeded across the country to New Barcelona on the coast. After a visit to Cuba they again returned to the continent, and having landed at the town of Carthagena, proceeded to the Rio Magdalena, which they ascended as far as it was navigable. On leaving the Magdalena they pursued their route to Popayan and Quito, and penetrated southwards as far as Lima, in the course of their journey crossing the Cordillera of the Andes no fewer than five times, and obtaining much new information respecting the upper portions of the river of the Amazons, a part of one of the branches of which they descended, having entered it at a point considerably higher than that where De la Condamine had begun his voyage. From Lima they went by sea to Guayaquil, and thence in the same manner to Acapulco in New Spain. The examination of the town and vicinity of Mexico and the other parts of that interesting region concluded their researches in America, in the course of which, besides large and important accessions to natural history, antiquities, and various other branches of knowledge, the geographical positions that had been determined amounted to nearly seven hundred.

Still further additions to the geography of South America may soon be expected from M. Bonpland, who, having gone out to Buenos Ayres in 1818, two years after undertook a journey to Paraguay, where he was seized and detained by orders of Francia, who had acquired an absolute authority in the province. He has recently, however, obtained his liberty, and is said to have now returned to France. From the opportunities of observation which he has had, we may expect a large addition to our knowledge of the hydrography of the Rio de la Plata, and the natural history of this portion of South America.

In 1817, when the Archduchess of Austria was married to Don Pedro, then Crown Prince of Brazil, Dr. Joh. Bapt. Von Spix, and Dr. C. F. Phil. Von Martius, were sent out in the train of the princess by the King of Bavaria, with instructions to explore some portion of that region of South America. Having landed at Rio de Janeiro, these travellers, after some time, proceeded to the city of San Paulo in the interior, from which they directed their course northwards to Villa Rica, having visited on the way the royal iron-foundries at San João de Ypanema. From Villa Rica they made an excursion to the Coroados Indians on the Rio Xipotó, and also ascended the mountain of Itacolumi in the neighbourhood of the town. They then, after some other excursions, went to the island of St. Louis, and there putting on board ship, arrived after a voyage of six days at Para, near the mouth of the Amazons. From this point they travelled along the bank of the river as far as to Pauxis, five hundred miles up the country, from whence pursuing their route in the same direction, they at length reached the mouth of the Rio Negro. Martius then proceeded up the Japura, till he reached the base of the mountain Arascoara; while Spix, following the main stream, crossed successively the Jurua, the Juratry, and the Iça, and penetrated to Tabatiaga, the last Portuguese settlement, at the mouth of the Jupary. On meeting again, the two returned together down the Amazons to Para. Their explorations, therefore, may be shortly described as having extended in one direction from the 24th degree of south latitude to the equator, and in the other from the mouth of the Amazons to the frontiers of Peru. Spix and Martius brought home extensive and valuable collections in natural history, which have been deposited in a building at Munich, called the Brazilian Museum, erected expressly for their reception.

A great part of the precious metals used in the world are brought from America, and, with the exception of the Mexican mines, almost all from the southern continent. Gold is found in New Granada, Peru, Chili, La Plata, and Brazil, and in North Carolina; and diamonds have been for some time a part of the Brazilian exports. The silver mines in Peru are very rich, and in Chili there are mines of silver, lead, and sulphur; those of copper are still more abundant. There are mines of iron, sulphur, antimony, tin, lead, copper, and quicksilver, in Brazil, but the pursuit of the precious metals appears to have diverted attention from other mining speculations. America also sends to Europe pearls and other precious stones. (See Maltebrun's *Geography*; Humboldt's *Travels*, &c.)

The following statement, from a parliamentary paper, exhibits a remarkable decrease in the supply of the precious metals drawn from America.

Gold and Silver Mines.—Statement of the value sterling of gold and silver raised in each of the several mining countries of America and Russia, in the two periods of twenty years from 1790 to 1809 inclusive, and from 1810 to 1829 inclusive; derived from the returns of British consular agents.

General Abstract, from 1790 *to* 1809

	Gold.	Silver.	Total.
	£.	£.	£.
Mexico . .	4,523,378	94,429,304	98,952,681
Panama . . .	223,518	——	223,518
Chili . . .	863,974	944,736	1,808,710
Buenos Ayres .	1,862,955	19,286,831	21,149,786
Total of America	7,473,825	114,660,870	122,134,695

From 1810 *to* 1829.

	Gold.	Silver.	Total.
	£.	£.	£.
Mexico . .	1,913,075	45,388,729	47,301,804
Panama . : .	23,603	——	23,603
Chili . . .	1,904,514	878,188	2,782,702
Buenos Ayres .	2,161,940	7,895,842	10,057,782
Total of America	6,003,132	54,162,759	60,165,891
Russia . . .	3,703,743	1,502,981	5,206,724
	9,706,875	55,665,740	65,372,615

V. THE MAN OF AMERICA. The native Americans constitute, at the present day, by their physical characters, not less than by their languages, a race different from those known before the discovery of America. The following general description of them has been given. The natives of this part of the world are, in general, of a robust frame and a well-proportioned figure. Their complexion is of bronze, or reddish-copper hue—rusty-coloured, as it were, and not unlike cinnamon. Their hair is black, long, coarse, and shining, but not thickly set on the head. Their beard is thin, and grows in tufts. Their forehead is low, and their eyes are lengthened out, with the outer angles turned up towards the temples; the eyebrows high, the cheek-bones prominent; the nose a little flattened, but well marked; the lips extended, and their teeth closely set and pointed. In their mouth there is an expression of sweetness, which forms a contrast with the harsh character of their countenance. Their head is of a square shape, and their face is broad, without being flat, and tapers towards the chin. Their features, viewed in profile, are prominent, and deeply sculptured. They have a high chest, massy thighs, and arched legs; their feet are generally large, though some have been noticed to have small feet and hands, and their whole body is squat and thick-set. Though the shape of the forehead, and of the vertex, frequently depends on artificial means, yet, independently of the custom which prevails amongst them of disfiguring the heads of infants, there is no other people in the world in whom the frontal bone is so much flattened above; and, generally speaking, the skull is light. Such are said to be the general characteristics of all the nations of America, with the exception, perhaps, of those who occupy its two extremities. The northern Esquimaux, for instance, are below the middle stature; the Abipones, it is said, and still more especially the Patagonians, exceed the ordinary height. This muscular constitution, with a tall figure, is in some degree met with among the natives of Chili, as well as the Caribbeans on the banks of the Caroni, a tributary of the Orinoco, and amongst the Arkansas, who are esteemed the handsomest natives of this continent.

The copper or bronze hue of the skin is, with some slight exceptions, common to almost all the nations of America; upon which the climate, the situation, or the mode of living, appear not to exercise the slightest influence. Some of the tribes in Guiana are described as nearly black, though easily distinguished from the negro. The colour of the natives of Brazil and of California is deep, although the latter inhabit the temperate zone, and the former live near the tropic. The natives of New Spain are darker than the Indians of Quito and New Granada, who inhabit a precisely analogous climate. The nations dispersed to the north of the Rio Gola, are darker than those that border on the kingdom of Guatemala. The Indians who, in the torrid zone, inhabit the most elevated Table Land of the Cordilleras of the Andes, have a complexion as much copper-coloured as those who cultivate the banana under a burning sun, in the narrowest and deepest valleys of the equinoctial regions. The Indians who inhabit the mountains are clothed, and were so long before the conquest, while the Aborigines that wander on the plains of South America are perfectly or nearly naked, and consequently are always exposed to the vertical rays of the sun. These facts show that the colour of the American depends very little on the local situation which he actually occupies; and never, in the same individual, are those parts of the body that are constantly covered, of a fairer colour than those in contact with the air; the infants, moreover, are never white when they are born.

It was formerly supposed that the Americans were without beards, and certainly there are many among them who have neither beard nor hair on any part of their person, except the head. But the Indians who inhabit the torrid zone, and South America, have generally a small beard which becomes longer by shaving, and among the Patagonians there are many who have beards. A late traveller (Temple) asserts that the Chiriguano Indians of the province of Tarija are beardless, without stating any opinion as to this being natural or the effect of plucking out the hair. Almost all the Indians near Mexico, and some on the north-west coast, wear mustachios. An inference has been drawn that the Indians have a larger quantity of beard in proportion to their distance from the equator. The deficiency of beard does not exclusively belong to the Americans, nor is it by any means a certain sign of degeneracy, for some beardless races, such as the negroes of Congo, are very robust, and of colossal size.

These physiological characters, according to some opinions, appear to establish an affinity between the Americans and the Mongol race of Asia, as well as the Malays, and others; but the resemblance does not extend beyond mere colour, and cannot apply to the more essential parts—the cranium, the hair, and the profile. The great number of separate languages proves that a considerable portion of the American tribes have long existed in that savage solitude in which they are still plunged. Dr. Von Martius (*London Geographical Journal*, vol. ii.) has ascertained the names of more than two hundred and fifty tribes, some of them consisting of very small numbers, in the interior of Brazil: many of these numerous sub-divisions are, no doubt, closely related to one another, but the present splitting up of the Brazilian Indians is a curious phenomenon. The want of a common language among so many tribes may be the effect of some great political convulsion, and it is, at the same time, a cause of gradual decay and extinction of races. Traditions, monuments, manners, and customs, seem to indicate some affinity with Asia, but the communications, if any, must have been anterior to the developement of the state of things prevailing in the present day.

In regard to the origin of the Americans, numerous conjectures have been formed. It has been supposed by one writer, that America was peopled from the dispersion of the Israelites—by another, that the Egyptians were the ancestors of the Mexicans—by some, that the Carthaginians—and by others, that the antient Celts, made expeditions to America. Indeed, what theory is there, however absurd, that will not meet with supporters, as long as facts are few and doubtful? Grotius has derived the North American population from the Norwegians, and the theory of the purely Asiatic origin of the Americans has met with numerous supporters, among whom Vater of Berlin, in his discourse on the Languages of America, inserted in Adelung's *Mithridates*, book 3, says it is a demonstrable fact, 'that on the north-west parts of America, in Greenland, and on the coast of Labrador, as also to the west of it, in the vicinity of the Asiatic coast, there dwells a people which is one and the same race with the inhabitants of the north-east coast of Asia, and of the islands lying between the two hemispheres.' This is probable enough, but what does it prove as to the great mass of the American population? In fact, the state of our knowledge is not such as to warrant us in coming to any certain conclusion on the subject. What the real affinity of this race or races of men is to the rest of the great family of mankind, is a question involved in obscurity; and speculation on this subject without a larger collection of facts is not likely to forward the discovery of truth.

America presents, both in the northern and southern continents, traces of the labour of man, which perhaps belong to no race that inhabited the continent at the time of its European discovery. In the valley of the Ohio, and indeed in numerous other parts of the United States, are found mounds of earth, and fortifications undoubtedly of high antiquity. Some of these mounds are overgrown with antient trees, like a part of the primeval forest,—a fact indicating an antiquity of at least many hundred years. The pyramids of Mexico, the remains and the bas-reliefs of Guatemala near Palenque, on the Usumasinta river, and the works of the Peruvian Indians, are, according to some opinions, the work of races anterior to any now existing; but how a more civilized race was compelled to yield to one less advanced, so as to leave no traces but what we see, is a thing rather difficult to comprehend. If we have learnt nothing else from inquiries into the history of man in America, we have learnt at least to reject the unfounded hypothesis of the very recent peopling and formation of that continent. On comparing the most accurate descriptions of the existing natives of widely-separated parts of this continent, we find some most marked differences both in physical appearance, manners, language, and knowledge of the useful arts. Whatever general resemblance we may discover, we find also differences quite as striking. Yet theories and generalizations are formed of the most plausible character, all tending wonderfully to simplify the subject by systematic classifications and general assertions. One, with great self-composure, will reduce all the languages (including those of which we know nothing) to a few great classes; and another again, in two or three sentences, will either elevate to a high point of excellence, or characterize as brutes and unfeeling savages, all the inhabitants of a continent that stretches almost from pole to pole. Ignorance of facts is the only source of all these sweeping assertions. The love of hasty generalization is one of the strong obstacles to knowledge which we of the present day have to guard against; the rapid accumulation of facts within modern times makes every successive writer think he has attained all the elements for forming a complete system. A careful examination of facts, as they rapidly increase, should teach a different lesson.

It is only of late years that the study of the native races of America has been prosecuted in a manner likely to lead either to probable results, or to accurate knowledge of facts, which may perhaps prevent us from coming to any results at all. It is only when the white man has destroyed or debased a large portion of the inhabitants of the New World, that he begins to inquire with more eager interest into the character and history of his predecessors in the possession of the soil. Races of men have undoubtedly disappeared before the civilizing influence of the white man, even in

Europe, and the same process has taken place in the New World, and is now taking place in Van Diemen's land. The white man covets the fertile lands which the native only roams over in pursuit of prey, or partially cultivates; and the process of the occupation of the land when once begun by the European colonist, especially those of the Teutonic stock, is only limited by the nature of the soil and the climate. The native gradually recedes and disappears till the white man has reached the boundaries of agricultural occupation, or till climate arrests his progress. Thus in North America, where the exclusive habits of the white colonist are intolerant of all modes of life but that which he prescribes, the Indian and he are mutual enemies; and the disappearance of the aborigines has regularly continued, till, from the Atlantic to the Appalachian system, scarcely a vestige of the primitive races worth noticing is found; from the Appalachian to the borders of the lower Mississippi the same history is rapidly in progress, and the western limits of the white man's rule must be the rude plains which he cannot cultivate. The Indian has only been preserved in the two Americas where he has mingled with the white man, and partly adopted his habits; or where impenetrable unwholesome forests, or cold inhospitable regions, have protected, or where, as in the case of the Araucanos of Chili, his own courage has saved him from extermination. The islands of the Columbian Archipelago present the singular spectacle of a whole race of people that has disappeared within the limits of recent and authentic history: their place is occupied by the white man of Europe as the master, and the black man of Africa as the slave; and who can say what may be the future revolutions in the history of these new occupants?

The European settlers have been, in North America, principally the British, with a considerable number of French and Spaniards, some Dutch, Swedes, and, especially in the state of Pennsylvania, U. S., a considerable number of Germans; in South America, the Spaniards and Portuguese have been the chief settlers, with some Dutch and English. The particular accounts of the various settlements will be found under the heads of the countries to which they refer.

The population of the western hemisphere has been thus distributed:—

Whites	13,500,000
Indians	8,600,000
Negroes	6,500,000
Mixed races	6,500,000
	35,100,000

and by another computation according to languages, the division is as follows:—

Speaking the English language . .	11,647,000
Spanish	10,174,000
Portuguese	3,740,000
French	1,242,000
Dutch, German, Danish, Swedish, and Russian	216,000
Indian languages	7,543,000
	34,562,000

But these estimates are necessarily very loose, nor is it easy to distinguish exactly the possession of the native tribes. They predominate, in North America, in the territories west of the Mississippi, and possess the vast regions north of the United States, and west of the St. Lawrence: native tribes are also found in Mexico and Guatemala. In South America, they occupy chiefly Patagonia, Tierra del Fuego, the Guianas, Brazil, and many parts of the basins of the Orinoco, Amazon, and La Plata.

V. ZOOLOGY OF AMERICA. The southern portion of this vast continent contains an animal population which is, in a great measure, peculiar, and among its mammals particularly, offers a large variety of forms and characters to which we find no corresponding types among the productions of any other country. In North America, the case is different; a great portion of it is placed under the same parallels, and similar in soil and climate to the corresponding parts of Asia and Europe. It is not surprising, therefore, that it should likewise resemble these continents in its zoological characters; more especially when it is remembered that the opposite shores of Asia and America approach within a short distance of one another at Behring's Straits. All animals which are capable of enduring the rigour of these high latitudes, may probably pass from one continent to the other, either by means of the ice, or by swimming to the different islands interposed between the opposite shores. Thus the common bear, the wolf, the fox, the glutton, the badger, the sable, the ermine, the beaver, the elk, and the rein-deer, are found equally in Sweden, in Siberia, and in northern America; and if a few *species*, such as the bison and musk-ox, appear to be more confined in their geographical range, it is, most probably, owing to particular circumstances: at all events, there is not, perhaps, a single natural *genus* to be found north of the fortieth parallel in one continent which does not equally exist in the other two.

Out of 1346 mammals which have been described and indicated by zoologists, no fewer than 537 species are found in America, whilst Asia, the next richest portion of the earth in the variety of its mammals, contains only 422; Africa, 300; Europe, 180; and Australia, 80. The following table exhibits the peculiar characters of American mammalogy, the manner in which the different orders are distributed with relation to this continent, and the relative proportion which the number of American species bears to the whole number in each order. Indigenous animals alone have been included; the ox, horse, and other domestic quadrupeds, imported by the European colonists, do not properly belong to American zoology.

ORDERS.	Whole No. of known species.	Whole No. of American species.	No. of species peculiar to America.	No. of species common to America and other continents.
I. Quadrumana	186	82	82	0
II. Cheiroptera	192	82	82	0
III. Carnivora	320	140	106	34
IV. Marsupialia	67	18	18	0
V. Rodentia	295	133	126	7
VI. Edentata	23	20	20	0
VII. Pachydermata	30	6	6	0
VIII. Ruminantia	157	30	28	2
IX. Cetacea	76	26	12	14
Total	1346	537	480	57

The peculiar and appropriate characters of American mammalogy are distinctly shown by this Table. Of the 537 species contained in the second column, 57 only, or little more than 1 in 10, extend into Northern Asia and Europe; and if from these we deduct the 14 cetacea and 16 species of seals comprised among the carnivora, which all inhabit the Frozen Ocean, the common northern boundary of these two continents and of America, it will be found that the land animals common to all three are reduced to the comparatively trifling number of 27, not a single species of which extends to the south of the isthmus of Darien. The great majority of them, indeed, belong to the carnivorous fur bearing quadrupeds, to the chase of which we are partly indebted for our geographical knowledge of the northern parts of Asia and America. They include the common brown and the Polar bears, the badger, and glutton, the dog, wolf, Arctic and common fox, and two or three other species or varieties, two or three feline animals of the lynx kind, the common weasel, the ermine, the pine martin, and the marine and river otters. The seven rodentia common to the old and new worlds are, the beaver, the common rat and mouse, the common squirrel, the varying or Polar hare, the zizel or souslic marmot, and the common water rat; the two ruminating quadrupeds are the elk and reindeer.

The mammalogy of the extensive continent of South America, at least as far as we are at present acquainted with it, is altogether peculiar. A very few species of *carnivora* and *marsupialia*, indeed, such as the couguar and opossum, extend into the southern parts of the United States; but the *quadrumana*, *edentata*, and *pachydermata*, without exception, and by far the greatest number of species belonging to the other orders, have never passed the isthmus of Darien, and are, consequently, confined exclusively to South America. On the other hand, few of the inhabitants of the northern continent extend into the southern; so that, in this respect, the two portions might almost be viewed as distinct continents. In other respects it is to be observed, and it is, perhaps, the most remarkable feature in American zoology, that, abstracting the *cetacea*, which are aquatic animals, three only out of the eight terrestrial orders have species common to this and other continents; whilst of the remaining five, the American species are exclusively confined to the southern hemisphere.

Among the Mexicans and Peruvians were found the very few domestic animals which existed in America previous to the arrival of Columbus; and even they possessed only the lama and vicunna, or pacos, (*Anchenia lacma* and *vicunna*,) and a small species of lap-dog which they called alco, and which is believed to have resembled the small naked variety at present found in Barbary and the Levant. The lama and pacos were used as beasts of burden, and the long and thick fleece of the latter furnished a rich fine wool, which was manufactured into cloth of a beautiful texture; the flesh of both species supplied an agreeable and wholesome food. The horse, the ass, the ox, the sheep, the goat, and the pig, are all strangers to the New World. Its inhabitants, therefore, in their progress to civilization, deprived of the assistance of these valuable domestics, had to contend with difficulties and to overcome impediments which were utterly unknown to the more fortunate Asiatic. Yet America is not destitute of herbivorous animals, which, in a domestic state, would have vastly contributed to increase the power and resources of the native tribes. Of the thirty ruminating animals, indeed, which are found in America, by far the greater number belong to the deer-kind, which are not well adapted for domestic purposes. Still the bison, (*Bos Americanus*,) the big-horned sheep, (*Ovis montana*,) and the Rocky Mountain goat (*Capra Americana*) would have been most valuable domestics, and have materially improved the condition of the natives. The companions of Cortez found these animals all preserved as curiosities, with the other indigenous animals of the country, in the menageries of Montezuma.

Since the planting of the European colonies and the introduction of the arts and agriculture of civilized life, the domestic animals of the Old World have increased prodigiously in every part of America. In many places they have even regained their pristine state of savage freedom; innumerable herds of wild oxen cover the rich Savannahs of Brazil, Buenos Ayres, and Colombia; and troops of horses, equally wild, are found in every part of the Pampas of South America, and likewise in the high plains of the Arkansas in North America. A nominal property in these wild herds is generally claimed by particular individuals, and they are assembled also at particular periods to be marked and counted; but, in all other respects, they are left to the unrestrained exercise of their natural freedom. The horned cattle are principally valuable for their hide and tallow, which are for the most part shipped to European ports, and constitute two of the staple commodities of South American exportation. From Buenos Ayres and Montevideo alone, as we are assured by Azara, upwards of 800,000 hides are exported annually. The custom of hunting cattle for this purpose is become, in South America, a particular trade, and a native is never considered properly educated till he can throw the lasso, or use the knife with skill and dexterity. For the purpose of procuring hides, it is necessary that a number of horsemen should unite. These arrange themselves in two lines, forming an angle; they then separate a small troop of cattle from the general herd, and press them in upon right and left, whilst the hunter who forms the apex of the angle, with a small semicircular adze which he carries for that purpose, houghs each beast in succession as he comes up with it, till the whole troop are disabled. During all this operation, the hunters are kept at a sharp round gallop, but as soon as they have thus secured a sufficient number of beasts, they return upon their steps, preceded by the same individual who formed the point of the angle before, and whose present duty it is to pith the animals, which he does in a most dexterous manner by a single stroke of a small dagger, whilst his companions who follow him are engaged in flaying the carcass and separating the tallow. When a single beast is wanted, however, for the purposes of the table, it is more usually procured by means of the lasso, which is nothing more than a noose at the end of a long coil of rope, but which, from the unerring certainty with which it is thrown, becomes a most formidable weapon in the hands of the South Americans. The other end of the rope is secured to the saddle, or girths, of the rider, and in this way he will gallop for miles, dragging a wild ox behind him.

In the immense Pampas of South America, there are numerous troops of wild horses, which, though of less importance than the horned cattle, are not without their uses to the inhabitants; in fact, they furnish the only means of crossing these extensive plains, and, consequently, of communicating with the neighbouring countries. The traveller and his guide set off on horseback, driving a wild troop of these animals at full gallop before them: when one beast is exhausted, another is secured by means of the lasso, the saddle is changed, the rider mounts and continues his journey, repeating the same operation as often as requisite till he arrives at his station for the night; here he obtains a fresh troop, and in this manner will travel for many days in succession, at the rate of 100 or 120 miles a-day. Much curious information concerning this mode of travelling, as well as on other subjects connected with South America, may be found in Captain Head's *Rough Notes of a Journey across the Pampas*, and also in Temple's *Peru*. Azara informs us, that the Indians of the Pampas are very partial to horse-flesh, and Mr. Ross Cox, in his late valuable account of the Colombia River, assures us that not the Indians alone, but likewise the European fur-traders who annually ascend that river, depend for their subsistence chiefly upon horse-flesh, and that to procure 'horses for the kettle,' they are often obliged to give an extravagant price, and sometimes even to sacrifice the animals which are necessary for the transport of their merchandise.

The ass, the sheep, the goat, and the hog were likewise introduced into America, both north and south, by the early European colonists; with the exception of the hog in the United States, they have not increased in the same proportion as the horse and ox. The ass is principally employed in the old Spanish and Portuguese settlements for the purpose of breeding mules, which are universally employed in transporting the precious metals, and possess all the wonderful sagacity in discovering and avoiding danger, and all the security of foot, which have, in all ages of the world, rendered this animal so valuable in mountainous countries.

Of wild indigenous animals, as has been already observed, America contains a prodigious variety, many of which are altogether peculiar, and others present types of organic structure to which we find no analogous forms in any other quarter of the world. Among these the quadrumanes, or American monkeys, are not the least singular. They are called monkeys, it is true, because the original discoverers of the country were ignorant of a more appropriate term by which to designate them, and because they bear a greater resemblance to the animals of the old world, properly so denominated, than to any other beings; but so entirely distinct are they from these animals in their zoological characters and functions, that they not only belong to different species, but even to different natural genera. Those of Africa and Asia have completely opposable thumbs on the fore-feet, as well as on the hind; they have universally ten molar-teeth in each jaw, as in man, and are generally provided with cheek-pouches and naked callosities: the American simia, on the contrary, are always destitute of the two latter organs; they have universally twelve molar-teeth in each jaw, and the thumbs of their fore-hands are, more properly speaking, versatile, or capable of occasional opposition, than habitually opposed to the other fingers. One extensive genus (*Ateles*) is absolutely destitute of thumb altogether, and the great majority of the species are provided with a prehensile power in the tail, which converts this organ into an actual fifth limb, and enables the animals to rest suspended from the branches, or swing from tree to tree with an ease and velocity which are truly surprising. Other species are destitute of this prehensile power in the tail, but exhibit all the other characters of the American quadrumanes in general.

Compared with the apes and monkeys of the Old World, the sapajous and sakis of America are certainly an inferior race of beings. In no instance do they exhibit the close proximity to man, which we observe in the orang-outang and chimpanzee; and their inferior links acquire the lengthened muzzle and slanting incisors, which approximate them to the lemurs and other inferior animals. All are remarkable for the gentleness of their disposition and the docility of their character, equally opposed to the ferocious nature of the baboons, and the restless petulance and ceaseless curiosity of the monkeys, properly so called. Their habitat is entirely confined to the tropical forests of South America, which resound at the rising and setting of the sun to the loud drum-like voice of the alwatas, or preaching monkeys, (*Mycetes*,) the hoarse-cry of the *Ateles*, and the shrill, piping voice of the sajous (*Cebus*). All these genera are remarkable for the prehensile power of their tails. Of those which are destitute of this faculty, the saïmiris (*Callithrix*) are distinguished by the smallness of their size, the elegance of their forms, the gracefulness and rapidity of their motions, and their gentle and playful disposition. The sakis (*Pithecia*) again join the general organization of the quadrumanes to the projecting snout and bushy tail of the fox, whilst the douroncouli (*Nocthores*) has the nocturnal manners and tardy pace of the slow lemurs (*Nycticebi*) of Asia, and appears to be the only representative of these animals in the western hemisphere. All these animals are sought after and eaten with avidity by the free Indians; and even Europeans, who have overcome their prejudices so far as to partake of the flesh, report it to be tender and agreeable.

Of the cheiroptera, winged mammals, or bats, peculiar to America, the most remarkable are the vampires, (*Phyllostoma*,) which are of a large size, and live upon blood, which they suck from men and animals while asleep, by the assistance of their long-projectile tongues and lips, furnished at the point and on the edges with a number of papillæ disposed for that purpose. As their bite is usually in the foot, and never creates pain sufficiently sharp to awaken the person attacked, it not unfrequently proves fatal from excessive hemorrhage: the vampires are, consequently, much dreaded by the inhabitants, and every precaution is used to guard against their attacks. Happily, they are by no means numerous, and are confined to the moist, tropical climates of Guiana, Colombia, and Brazil. No species of the roassettes (*Pteropus*) or frugivorous bats exists in America: in other respects the cheiroptera of this hemisphere differ in no essential characters from those of the Old World.

America is extremely rich in the variety of its carnivorous mammals. Of 320 species belonging to this order, America contains no fewer than 140, or seven-sixteenths of the whole, and of these the great majority, as has been already observed, are altogether peculiar to this continent. Those which are common to the northern latitudes of America, and the corresponding parts of Asia and Europe, have been already noticed. Of the others, the most remarkable are the grizly bear of the Rocky Mountains, (*Ursus ferox*,) the largest and most ferocious species of this genus. The spectacled bear, (*Ursus ornatus*,) a species but recently described, though it is mentioned by all the older writers on South America, inhabits the chain of the Andes, and is of a smaller size, and less carnivorous propensity. The common bear, (*Ursus arctos*,) the black bear, (*U. Americanus*,) with its variety the cinnamon bear of Hudson's Bay, and the white or Polar bear, (*U. maritimus*,) inhabit the northern parts of the continent, and are hunted by the fur traders for the sake of their pelt. The racoons, (*Procyon*,) the coatimondis, (*Nasua*,) and the kinkajou, (*Cercoleptes*,) are three small genera of carnivorous mammals peculiar to the southern states of the North American Union, and to the continent of South America; the latter is remarkable as being the only genus of carnivora provided with a prehensile tail; it is also found in Jamaica, and other West Indian islands. The mouffettes, (*Mephitis*,) are likewise a genus peculiar to the New World. Of the genus *canis*, or dog kind, America possesses eighteen or twenty different species, of which twelve or fourteen are peculiar. Besides the prairie wolf, (*Canis latrans*,) the Mexican wolf, (*C. Mexicanus*,) and the maned wolf, (*C. jubatus*,) these comprise many beautiful species and varieties of foxes, of which the fur is of great value in a commercial point of view. The species most valued on this account are the arctic fox, (*C. lagopus*,) with its blue variety, (*C. fuliginosus*,) the common American fox, (*C. fulvus*,) the cross fox, (*C. decussatus*,) the black, or silver fox, (*C. argentatus*,) and the kit fox, (*C. cinereo-argentatus*,) the smallest American species of this genus. The civets, paradoxures, ichneumons, suricats, and hyænas of the Old World, have no representatives in America. Of the cat kind, (*Felis*,) however, this continent contains numerous species, all equally remarkable, like their congeners of the Old World, for the beauty and diversity of their colours, and the treachery of their disposition. The jaguar (*F. onça*) nearly equals the Asiatic tiger in size and ferocity; it is confined to South America. The couguar, or puma, (*F. discolor*,) on the contrary, is occasionally met with in the southern states of the Union, and has even been known to stray as far north as Canada. This animal is often, though very improperly, called the American lion. The ocelot, (*F. pardalis*,) the margay, (*F. tigrina*,) and numerous other smaller species, are chiefly distinguished by the beauty and variety of their colours. The lynxes, distinguished from the other cats by their shorter tails and pencilled ears, are the only species of the whole genus which are valuable in a commercial point of view; and of these, the northern and western parts of America contain three or four distinct species, all of which furnish a long, thick, and valuable fur.

Though Australia appears to be the head-quarters of the marsupial mammals, one extensive genus, (*Didelphys*,) and a smaller one, (*Cheironectes*,) containing at present but a single species, are nevertheless peculiar to South America, and this coincidence in the zoology of two such distant continents, of which the productions of one, in particular, are at once so limited and so peculiar, is perhaps one of the most extraordinary circumstances in the whole geographical distribution of mammals. The distinguishing character of the marsupials, as such, consists in the abdominal pouch with which the females are provided, and in which the young are deposited at a period long prior to their complete developement. The opossums (*Didelphys*) and yapocks (*Cheironectes*) are further remarkable for their prehensile tails and opposable hind-thumbs. The first of these genera contains a great variety of species, which offer nothing remarkable; with the exception of the Virginian opossum, (*D. Virginiana*,) they are all confined to South America: the second genus, on the contrary, contains but a single species, the yapock, (*C. Palmata*,) one of the most singular and anomalous animals in existence: this little animal inhabits the rivers of Brazil and Guiana.

Among the rodentia, the continent of America is particularly rich in those tribes which have been found serviceable in the economy of human life. The beaver (*Castor*) is now almost exclusively confined to Canada and the north-west districts of America. Even here, however, their numbers are daily diminishing. In the year 1743, the imports of beaver skins into the ports of London and Rochelle exceeded 150,000; in the year 1827, the whole import, though from four times the extent of fur country known in 1743, only amounted to 50,000. The musquash, ondatra, (*Arvicola zibethicus*,) or musk beaver, as it is sometimes called, is a little animal resembling the beaver in its social habits, as well as in the fineness of its fur, which is equally used in the manufacture of hats. It inhabits all the rivers and streams of Canada, and, like the beaver, builds a hut to protect it from the severity of the winter. Between 400,000 and 500,000 skins of this animal are annually imported from Canada. The coypou (*Myopotamus*) is an animal closely resembling the beaver in size, quality of fur, and general organization, but its tail is round instead of flat, and it does not form the societies nor construct the residence for which the latter species is so well known. It seems, nevertheless, to represent this species in the rivers and lakes of South America, from whence its fur is brought under the improper name of Racoönda. The chinchilla is another animal of South America, remarkable for the beautiful, soft, and rich texture of its dark ash-coloured fur. It is a small species, about the size of a guinea-pig; inhabits Peru, Chili, and Buenos Ayres, and resides in deep burrows, which it constructs beneath the surface of the earth. Of the hare genus, (*Lepus*,) America contains five or six distinct species, one of which, recently discovered, (*L. Californica*,) is remarkable for the brilliant white colour of its long ears, and the rich ashy-brown of its fur. But the cavy family, comprising the agoutis, (*Chrysochloris*,) the pacas, (*Cælogenys*,) the capybaras, (*Hydrochærus*,) and the cobayes, or guinea-pigs, (*Anæma*,) forms indisputably the most distinguishing and characteristic feature in this department of American zoology. These animals are peculiar to America, and for the most part, to the southern continent: the common agouti, however, extends into Carolina, and with the racoon and houtias, (*Capromys*,) constituted the largest mammals indigenous to St. Domingo, Jamaica, and the West Indian isles. The last-mentioned genus has been but lately discovered; it is composed of arboreal animals, as far as at present known, peculiar to the island of Cuba. The coendoos, or prehensile-tailed porcupines, (*Synetheres*,) are likewise peculiar to the American continent, and are not the least singular of its productions. The urson (*Hystrix dorsata*) inhabits the United States and Canada and is the only species of porcupine, properly so called, which appears to have the power of climbing trees.

But of all other tribes of mammals, the edentata are those which are most especially characteristic of the zoology of America. Of twenty-three species, and seven genera, which compose this singular order of animals, no fewer than twenty species and five genera are exclusively confined to South America. These genera are the aï and sloths, (*Bradypus* and *Acheus*,) the armadillos, (*Dasypus*,) the chlamyphores, (*Chlamyphorus*,) and the ant-eaters, (*Myrmecophaga*.) Of the two remaining genera, the aardvark (*Orycteropus*) inhabits the Cape of Good Hope, and the pangolins (*Manis*) are distributed over the continents of Asia and Africa: the former contains but one, the latter two species. The genus *Chlamyphorus* contains but a single species, (*C. truncatus*,) which inhabits Chili, and lives almost entirely beneath the surface of the earth. The anteaters (*Myrmecophaga*) are entirely destitute of teeth, and, as their name imports, live exclusively upon ants, which they catch by means of their long, cylindrical tongues, covered with a glutinous saliva. The great ant-bear (*M. jubata*) is as large as a good-sized dog, and though destitute of teeth, and slow of foot, defends himself with courage and success, by means of his large and powerful claws, even from the attacks of the jaguar. The small species, (*M. didactyla*,) about the size of a rat, has a prehensile tail, and resides entirely in trees. There is also a third species of intermediate size, (*M. tamandua*,) which is likewise said to ascend trees, though it is without the prehensile power in the tail.

America is as remarkable for its poverty in pachydermatous mammals, as for its richness in edentata, and this is another most singular character in its zoological productions. The order *Pachydermata* contains nine existing genera, and thirty species; yet, of all these, only a single genus and four species are peculiar to America, for two of the six species mentioned in the table are doubtful, and rest upon very slender authority. The elephant, the hippopotamus, and the rhinoceros, have no existing representatives in this continent: of the tapirs, (*Tapirus*,) there are two American species, the common tapir, (*T. Americanus*,) and a new species recently discovered in the Andes, but not yet sufficiently known. We have already mentioned, that no species of the horse kind (*Equus*) is indigenous to America; the hogs, however, are represented by the closely-allied, though distinct genus of peccaries, (*Dicotyles*,) which contains two species, (*D. torquatus*, and *D. labiatus*,) both peculiar to this continent. These animals are gregarious, and inhabit the primeval forests of South America, living entirely upon vegetable substances, and uniting to defend themselves from the attacks of beasts of prey.

Out of 157 species of ruminating quadrupeds, thirty only are found in America; and of these, only five species belong to the hollow-horned family. Two of these, the bison and musk-ox, belong to the genus *Bos*; the big-horned sheep, (*O. montana*,) to the genus *Ovis*; the rocky mountain-goat, (*C. Americana*,) to the genus *Capra*; and the fifth, called cabree by the natives, has been generally referred to the antelopes, though it differs essentially, in many important characters, from all the other known species of that genus. The Rocky Mountain goat is remarkable for its long white hair, of a fine silky texture, finer even than that of the shawl-goat of Cashmere and Thibet, and which, if procured in sufficient quantity, would form a most valuable article of commerce and manufacture. All these species inhabit North America. The only ruminating animals which are found in the southern continent, exclusive of the lamas already mentioned, are various species of deer, which are remarkable only for replacing all other genera of ruminants in this extensive portion of the globe. North America likewise possesses many species of this genus, some of which, as the wapati, (*Cervus Canadensis*,) the elk, (*C. alces*,) and the rein-deer, (*C. tarandus*,) attain a very considerable size. The latter species is still found in numerous troops in the interior of Newfoundland, in the north-west territory, and as far north as Greenland, and the islands of the Frozen Ocean.

Of the cetacea, or whale kind, a great variety are found along the shores of America, particularly in high northern and southern latitudes. The most useful and remarkable are the common whale, (*Balæna mysticetus*,) the spermaceti whale, (*Physeter macrocephale*,) and the narwhale, (*Monodon monoceros*.) The *Manatee*, one of the two species of herbivorous cetacea of the genus *Lamantin*, which are found both in South America and Africa, is mentioned in our notice of the river Amazon.

Of American ornithology, we can undertake to give but a very limited account. We shall therefore confine ourselves to those tribes which are most serviceable in an economical point of view, or most characteristic of the zoology of the country. Rapacious birds are here as numerous as in other parts of the earth, and of a great many different species, as well of vultures as of owls, hawks, and eagles. The condor of the Andes (*Vultur gryphus*) is the largest bird of prey known; and the king of the vultures (*V. papa*) is remarkable for the variety of its colours, and the bright tints of blue and vermilion which mark its naked head and neck. Among the incessores, the most characteristic of American zoology are the humming-birds, (*Trochilus*,) remarkable alike for their diminutive size, and the brilliant metallic lustre of their plumage. These singularly beautiful little animals, of which there are upwards of 150 different species, varying from the size of a common wren to that of an humble bee, are principally found in the tropical regions of Brazil and Guiana; but extend also into the United States, beyond 38° North, and were found by Captain King even in the latitude of 55° South, in the Straits of Magalhaens. (See *Lond. Geog. Journal*, vol. i. p. 169.) America abounds in birds of the order of scansores. Maccaws, parrots, and parroquets, swarm in all the forests; and the singular and beautiful genera of *Toucans* (*Rhamphastos*) and couroucous (*Trogon*) are peculiar to the tropical forests of this continent. Of rasores, or gallinaceous birds, it also contains an abundant supply, though of a family essentially different from that which inhabits the woods of India and China, which have supplied us with the common fowl, the peacock, and the pheasant. These useful and important genera have no representatives among the indigenous birds of America, but their place is well supplied by the turkeys, (*Meleagris*,) the courasous, (*Alector*,) and the guans, (*Penelope*,) all of which have been reduced to a state of domestication, and people the farm-yards of different parts of America. Except the common turkey, which we originally received from Virginia, and not from the Levant, as the name erroneously implies, all these species are confined to South America; the northern portion of the continent abounds more particularly in the grouse (*Tetrao*) and partridge (*Perdrix*) families. Vast flights of pigeons also migrate periodically to different parts of the northern continent, frequently extending for many miles on each side, darkening the entire atmosphere, and often requiring four or five days to pass over a particular place.

The American ostrich (*Struthio rhea*) is much smaller than the African species, from which it is further distinguished by having three toes completely developed on each foot. It is found principally on the pampas or plains of Buenos Ayres, and Patagonia, from the banks of the Amazon to the straits of Magalhaens. There are no bustards (*Otis*) in this part of the world, but the agami, or trumpet bird, (*Psophia*,) the cariama, (*Dicholophus*,) the jabiru, (*Mycteria*,) the jacauas, (*Parra*,) and the kamichi, (*Palamedea*,) are genera altogether peculiar to America, and are the most remarkable grallatores, or wading birds of the New World. The scarlet ibis (*Ibis ruber*) and the American flamingo (*Phœnicopterus Americanus*) are characterized by the uniform deep scarlet colour of their plumage. Of aquatic, or swimming birds, (*Anseres*,) this continent likewise contains an abundant supply, and possesses specimens of all the different genera which inhabit the Old World. There is, however, nothing peculiar in this part of American ornithology; and indeed, the order of anseres, from the peculiar nature of their organization, which enables them either to walk, swim, or fly, as the occasion may require, are more equally and universally distributed over every part of the earth, than any other group of animals.

The reptiles of America are numerous, and often important, even in an economical point of view, though like the generality of this class in other parts of the world, the great majority of them are absolutely useless, and some dangerous. Among the former, the principal is the turtle, (*Testudo mydas*.) This animal resorts yearly to the islands and shores of the Orinoco, and other large rivers of tropical America, and also to the shore of the islands in the Columbian Archipelago, to deposit its eggs, which it buries by thousands in the sand, and which are eagerly sought after by the Indians who annually resort to these haunts of the turtle for the purpose of procuring them. Three or four species of alligators likewise inhabit the rivers of the American continent, and the large islands of the West Indian group contain a species which is closely allied to the common crocodile of Egypt. The agamas supply in America the place of the chameleon, and the iguanas furnish a white and tender food. Brazil produces a species of reptile (*Bipes cariococca*) which is destitute of fore legs; and Mexico contains another (*cheirotes*) which is entirely deprived of the hind. Among the serpents, the genus boa is peculiar to America: the great serpents of India and Africa are erroneously classed amongst this genus. It contains many different species, the principal of which are the boa constrictor, the anaconda, (*Boa scytale*,) and the aboma, (*Boa cenchris*.) They chiefly inhabit the swamps and inundated fens of the tropical parts of South America. The rattle-snakes (*Crotalus*) are likewise a genus exclusively American, and particularly formidable on account of the deadly venom of their bite. There are also four or five different species of this genus, all of which reach the length of five or six feet: the common species of the United States is extremely numerous about the sources of the Columbia river. Among the frogs and toads, the most remarkable are the great bull-frog of North America, (*Rana mugiens*,) whose croaking may be heard at more than a mile's distance, and the *Rana pipa* of Surinam, which hatches its spawn in certain cells with which the skin of the back is provided for that purpose, and which are inhabited by the young during their tadpole state. Finally, the hellbender of the Americans, (*Salamandra gigantica*,) the *amphiuma*, the axolotl of the Mexicans, (*Siren pisciformis*,) and the sirens, properly so called, compose genera exclusively American, and unite by their structure and habits the frogs and reptiles with the eels and cartilaginous fish.

It is impossible for us to enter into any details concerning the ichthyology of this, or indeed any other continent. The species and varieties of fish are so numerous, and so similar in all quarters of the globe, that their geographical distribution is more uniform than that of most other classes. The various fresh-water species of Europe have their representatives in the rivers and lakes of the New World; and the marine tribes which frequent the coasts of America are little different from those of our own shores. The species, indeed, may be distinct, but the generic forms and characters are invariably the same, or differ only in trifling circumstances. The common cod is in every sense the most important and valuable fish that frequents the American shores. The great sand-banks off the islands of Newfoundland and Cape Breton annually attract myriads of this species to feed upon the worms which it produces; and hither, as is well known, the ships of England, France, and America resort yearly during the fishing season.

Of the insect tribes in America, the mosquitos, though of most diminutive size, are unquestionably the greatest scourge of the moist tropical countries, and even of many parts included in the temperate zone. So great an annoyance are these persevering torments in Venezuela and along the banks of the Orinoco, that the first question which acquaintances ask upon meeting of a morning is, generally, 'How were the flies last night?' and the missionaries who have the misfortune to be sent into the interior where these insects are particularly numerous, are locally said to be delivered up to the mosquitos. The chigoe is another insect which inhabits the same localities, and is scarcely less to be dreaded than the mosquito. Centipedes of various kinds likewise abound in America; and the white ants and termites are as troublesome and as destructive as their congeners of Africa and India.

VI. BOTANY OF AMERICA.—The climate and soil of this extensive continent are so varied by its extensive mountain-ranges, rivers, and forests, and by its diversified geographical position, that it would be in vain to attempt an account of its vegetable productions in any other way than by following them in their changes from the stunted flora of the north to the splendid scenery of the equatorial regions, and thence southwards as diminished temperature and its attendant circumstances again successively reduce the plants to a condition at the southern extremity in many respects analogous to that of the arctic circle.

If we contemplate the surface of this part of the world with reference to those circumstances which produce the greatest effect upon vegetation, by the diversity of climate that they occasion, we shall find that its mountain-ranges, those eternal and stupendous obstacles, by means of which Nature had cut off all communication between contiguous lands, until the hardihood and skill of man succeeded in overcoming them—called the Rocky Mountains in the north, and the Cordilleras in all those countries to the south which once owned the dominion of Spain, form what may not unaptly be called a back-bone to the whole continent, dividing it from Patagonia to the Mackenzie River into two portions of nearly equal length but very unequal breadth, the eastern being many times wider than the western, which is comparatively little more than a line of coast.

The vegetable productions of the two sides of this dividing line are so exceedingly different, that it will be indispensable to notice them separately.

The most northern station in which vegetation has been discovered, is Melville Island, 74° 50′ N. lat. Of this desolate region a very accurate account has been drawn up from the materials collected by the officers attending Captain Parry, and from it we learn, that although the mean temperature of the year is 1° to 2° below zero; and that of July, even on shipboard, where it may be supposed to be influenced materially by the fires that are constantly burning, but little more than 42°; yet that a considerable number of species are able to maintain an existence. These, however, are all of a very humble growth, the principal part consisting of saxifrages, grasses, cruciform plants, mosses, and lichens; not a tree or even a bush is able to rear its head, nor, indeed, is there a single plant of woody structure, except a little willow, (*Salix arctica*,) which rises six inches high. It is in these latitudes that the red snow-plant (*Protococcus nivalis*) that most simple of cryptogamic vegetables, exists in all its beauty, multiplying even among the snow itself, which it stains with crimson patches of considerable size.

In this part of the flora a decided similarity exists to the plants of the same latitudes in Europe and Asia; in many instances the species are distinct, but the general character of the vegetation is that of the Arctic Circle in the Old World. Even as we advance southward the features of the country are like those of Norway; vast forests of spruce firs, (*Abies alba* and *nigra*,) among which grow the reindeer moss and other lichens of Lapland, overspread the land. To these are added different kinds of wild currants, gooseberries, whortleberries, and a shrub extremely similar to the Gueldres rose of our own marshes (*Viburnum oxycoccus*), strawberries, and a variety of papilionaceous plants which abound in the open plains. With these are combined, as we continue to advance, the majestic poplars of Canada, (*Populus hudsonica*, and others,) birches, (*Betula papyracea*, and *populifolia*,) and many sorts of oaks and ashes, together with butter nuts (*Juglans cinerea*) and hickories (*Carya alba* and *amara*.)

It would be entering into a far more elaborate view of this subject than the limits of this work will admit, if we were to attempt to trace such changes with any kind of precision; all we can do is, having now pointed out the fact of a gradual change in the face of vegetation, to proceed to notice the great and distinctive features of other American districts, still confining ourselves to the eastern side of the continent.

We will suppose that we have arrived at the frontier of the British possessions in North America, where the sugar maple (*Acer saccharinum*) pours forth its saccharine juice at the first arrival of warm weather, even before the snows have had time to melt; the azalias add their gay and fragrant blossoms to the beauty of the opening summer; while the autumn is closed by the appearance of many kinds of asters, which stud the woods and meadows with their white or violet starry flower-heads. At this point wheat and other kinds of grain with maize are successfully cultivated, and even tobacco, such is the degree of summer-heat, is a common field-crop.

In the United States the great features of the North American flora are at length assumed. The forests consist of pines and larches unknown in Europe, of many kinds of oaks, of locust-trees, (*Robinia pseudo-acacia*,) black walnuts of enormous size, hickories, and ashes; among which the noble tulip-tree rears its towering head: in the swamps grow the deciduous cypress, (*Taxodium distichum*,) the white cedar, (*Cupressus thyoides*,) certain fir-trees, (*Pinus serotina* and *Abies pendula*,) the rhododendron, the glaucous kalmia, andromedas, sarracennias, and the glaucous magnolia; the sides of the mountains and hills are covered with the American arbor vitæ, magnolias, and hemlock spruces, among which spring up the arborescent azalea, the sorrel-tree, (*Andromeda arborea*,) and the beautiful mountain laurel (*Kalmia latifolia*); and, finally, the undergrowth of the woods and plains contains endless species of aster, several kinds of azalea and asclepias, dwarf pyrus, and various species of the exclusively American genera, liatris, phlox, gerardia, calycanthus, &c. Tobacco, maize, and wheat, are the staple objects of cultivation.

The approach to a tropical climate is first indicated by fields of cotton and rice, which on the Atlantic side commence at no point that can be definitely fixed, but *generally* may be said to begin south of Virginia. As we advance westward, towards the Mississippi, and cross that river, we experience a climate with a mean temperature, less than the parts on the Atlantic coast under the parallel. The line of tropical vegetation, therefore, does not advance so far to the north in the western parts, as on the Atlantic coast. (See Darby's *Geography of the United States*.) These southern countries, the climate of which is increased in heat and humidity far beyond that of corresponding latitudes in other parts of the world, present a complete mixture of the vegetable productions of Mexico and the northern states. Along with the principal part of the plants of Virginia and Kentucky, we have not only the cotton, the indigo, and the sugar-cane, as common articles of cultivation, but the planes and the deciduous cypress acquire gigantic dimensions. A solitary epidendrum inhabits the branches of the magnolia near Savannah. In the same neighbourhood is found the *Pinckneya*, a plant closely allied to the jesuit's bark of northern Peru; and the woods are filled throughout the Floridas, Carolinas, Alabama, and on the banks of the Mississippi, with dense masses of the tropical *Tillandsia usneoides*, which hangs from the branches of the trees like gigantic moss.

In southern Mexico we enter the tropics; and in all the valleys and plains where the temperature is not lowered by interrupting causes, the usual vegetation of such latitudes occurs. Palms, bananas, and plantains, and yams, yield the natives an abundant supply of food, which, produced without labour, and amply sufficient for their simple habits, oppose the greatest of all bars to the advancement of knowledge, or the excitement of industry among them. Habitually indolent, rendered still more so by the numerous holidays prescribed by his religion, and finding a few square yards of ground, which hardly requires tillage, capable of producing plantains and tobacco enough for his consumption, the Mexico-Spanish peasant is incapable of understanding the advantages of a life of industry, or the use of those active habits which alone are capable of raising him to the condition of truly civilized man. Besides these and the other common articles of cultivation by the inhabitant of the tropics, such as indigo, coffee, sugar-cane and maize, which here finds its native home, the cocoa-tree (*Theobroma cacao*), from whose seeds chocolate is prepared, is a most important species; the exportation of the seeds of this plant, which is found wild in the most burning districts, is valued at near 80.000*l*. sterling annually. Pine-apples are wild in the woods; the American aloe (*agave Americana*) yields, when wounded, an abundance of sweet fluid which is fermented into an intoxicating drink called *pulque*, and distilled into an ardent spirit known by the name of Vino Mercal; and great numbers of cacti occupy the dry and almost earthless situations, where little else will grow. In the low woods of Honduras are found those enormous forests which, since they have been wrested from the Spaniards, have been productive of such important commercial advantages to England from the abundance of mahogany and logwood-trees they contain. It is here also that the tamarind and the lignum vitæ (*Guaiacum officinale*) are found; the vanilla, whose pods are extensively used in Spain, Italy, and France, and the jalap convolvulus, which derives its name from the city of Xalapa, near which it principally abounds.

But in the highlands of Mexico, all this glorious vegetation disappears; the eatable-rooted nasturtium (*Tropæolum esculentum*) and the tuberous wood-sorrel (*Oxalis tuberosa*) supply the place of the yam; mahogany-trees give way to oaks, and to the singular hand-tree, (*Cheirostemon*,) the five united stamens of whose flowers are disposed like the talons of a bird of prey; while the pine tribe finds its most southern limits, and the herbage is composed of genera either resembling or identical with those of the more northern regions.

In the lower parts of these highlands the vegetation of course is more nearly the same as that of the plains, but in many places it exhibits a striking combination of the two, as, for example, near Xalapa, where the woods contain great numbers of oaks, the stems of which are covered with a host of orchideæ, peppers, and ferns.

In many respects the West Indies resemble the tropical parts of Mexico; the plants are either naturally the same, or have become so by importation from one shore to the other, or at least have a general resemblance, the principal difference being caused by the greater humidity of the atmosphere of the West India Islands in consequence of their insular position. Thus in the whole flora epiphytal orchideæ and ferns, especially of the arborescent kind, are more abundant; certain fruit trees are in many cases more luxuriant, and more generally cultivated, as the avocado pear (*Laurus persea*), the mango, the custard-apple (*anona squamosa*), and the guava (*psidium*); and it is said that the cabbage-palm attains the height of 200 feet. Coffee is an article of general and advantageous growth, and the tobacco of Cuba is only equalled by that of Persia and of some parts of the Burmese empire. Cloves are becoming generally cultivated; allspice (*Myrtus pimenta*) is a common tree on the hills; and in some of the islands, the nutmeg, imported from the East Indies, is thriving prodigiously, and latterly beginning to yield a crop. Aloe trees are cultivated in Jamaica and Barbadoes for the sake of their inspissated juice. [See ALOE.] Mandioc and yams are the common food of the negroes, along with plantains and rice; and a kind of arum (*Caladium esculentum*) is used at table as spinach is with us. Considering the number of degrees of latitude over which the West Indies extend, it is impossible to give any general account of their plants which will be true of all of them; it must therefore be borne in mind, that in general their flora agrees with that of the continent in the same latitude over against which they lie.

In all the remainder of eastern tropical America similar characters of vegetation are found. Where the air is dry and hot, the plants assume a parched and stunted character; but wherever, as is usually the case, there is a perfect combination of heat and moisture, the grandeur of the trees and the beauty of the flowers is beyond description. But the genera and species gradually change as we recede southward from the line. In those provinces to the north of the line, which, under the name of Cumana and the two Guianas, form a sort of crest to the equatorial region, the land beyond the limits of cultivation is overspread by impervious forests, which, in the language of an eye-witness and a botanist, are so completely choked up by huge twiners, spiny shrubs, and sharp-edged grasses, that a hatchet is necessary at every step to clear the way. It is here, however, that the quassia bitter, the fragrant tonga bean, which is so much employed for perfuming snuff, and the rose-wood, are produced. Cannon-ball trees (*Lecythis*) drop their monstrous fruits in these forests, and furnish the numerous monkeys with a ceaseless store of amusement; and arborescent species of the cinchona tribe (*Portlandia*, &c.) furnish medicinal barks scarcely inferior to that of Peru.

In Brazil the country is more open, and the scenery is consequently more diversified; besides which, it may be easily conceived that many most striking changes would occur in twenty-three degrees of latitude. A notion of its average state may be obtained from a consideration of the plants of the almost central province of Minas Geraes, an account of which, by M. Auguste de St. Hilaire, gives us many facts relating to the state of its vegetation before it became altered by the inroads of the Portuguese settlers.

The whole face of Brazil may be said to be divided into forests, deciduous stunted woods, and immense plains, to each of which a peculiar vegetation appertains.

When a European arrives in South America, there is nothing that produces so striking an impression upon him as the general resemblance that he perceives between the external aspect of the forests of the New World and those which he has left behind: a little more grandeur in the proportions, and a deeper green, together with a clear and brilliant sky, constitute the principal difference in the two scenes. To see the full beauty of an equinoctial forest, it is necessary for the traveller to bury himself in its deep recesses; and there, indeed, instead of the fatiguing monotony of our European oaks and firs, every tree has a character of its own, each has its peculiar foliage, and probably also a tint unlike that of the trees which surround it. Gigantic vegetables of the most different families intermix their branches; five-leaved bignonias grow by the side of bonduc-trees; cassias shed their yellow blossoms upon the rich fronds of arborescent ferns; myrtles and eugenias, with their thousand arms, contrast with the elegant simplicity of palms; and among the airy foliage of the mimosa, the cecropia elevates its giant leaves and heavy candelabra-shaped branches. Of some trees the trunk is perfectly smooth, of others it is defended by enormous spines, and the whole are often apparently sustained by the slanting stems of a huge wild fig-tree. With us, the oak, the chestnut, and the beech seem as if they bore no flowers, so small are they and so little distinguishable except by naturalists; but in the forests of South America it is often the most gigantic trees that produce the most brilliant flowers; cassias hang down their pendents of golden blossoms, Vochisias unfold their singular bunches; corollas, longer than those of our foxglove, sometimes yellow or sometimes purple, load the arborescent bignonias; while the chorisias are covered, as it were, with lilies, only their colours are richer and more varied; grasses also appear in the form of bamboos, as the most graceful of trees; bauhinias, bignonias, and aroideous plants cling round the trees like enormous cables; orchideous plants and bromelias overrun their limbs, or fasten themselves to them when prostrated by the storm, and make even their dead remains become verdant with leaves and flowers not their own. Such are the antient forests, flourishing in a damp and fertile soil, and clothed with perpetual green.

Far different are the deciduous stunted woods, called *catingas*, which are produced on a dry sandy soil, and are not dense enough to prevent the evaporation of their scanty earth; they periodically lose all their leaves in March and April, not recovering them till the month of August. When stripped of their leaves, they have a great similarity to the woods of Europe in their winter nakedness, bushes and small trees mixed here and there with individuals of a moderate size constituting their composition. Small acanthaceous plants, resembling our own labiatæ, fill up the intervals in these woods, and one might almost fancy one's self in a European wood, in a fine autumnal day, if it were not for the palms which here and there raise their heads above the other trees.

As for the plains, they consist for the most part of immense tracts, which have no more horizon than an ocean; destitute of even turf, they are covered not only with grasses of different kinds, but with undershrubs and small bushes of myrtles, melastomas, compositæ, and a multitude of other things. Among these, a few trees, here and there, collect into a cluster, and form a kind of oasis in a vegetable desert.

To the southward, all these things gradually fade away; vegetation becomes less and less tropical, never, however, assuming a European aspect, till at last in Patagonia and the adjacent islands, an antarctic imitation of northern vegetation makes its appearance. Beech-trees of new species, singular parasitical plants (*Misodendron*), Winter's bark, stunted berberries, evergreen arbutus, with a trailing habit, plants like buttercups, yet not buttercups, form the distinguishing features; and the traveller occasionally is astonished at seeing arborescent Fuchsias in flower, with humming-birds flitting among their branches in the midst of a snow-storm.

Of New South Shetland nothing can be said to be known, unless we admit the improbable statement adopted by Miers from the account of a navigator named Smith, that it is occupied by trees resembling our Norway spruce fir.

The western coast is far different, latitude for latitude, from the eastern; chilled by the unmitigated cold blasts from the south pole, destitute of large rivers and of all means of irrigation for a very considerable extent, it is a mere succession of fertile valleys and desert hilly plains. To the south, the sides of the mountains are covered with the Araucaria pine; in Chili, the peculiar forms of numerous species of Calceolaria, Schizanthus, Loasa, Adesmia, Azara, and Escallonia, form a flora of a totally different aspect from that of Buenos Ayres, while the sandy plains abound in numerous species of the purslane tribe (*Calandrinia*) and of salpiglossis. Numerous bushes of compositæ give an arid but glittering aspect to other parts; and in the spring, at the time of the melting of the snows, the sides of the mountains are enamelled with the beautiful flowers of the pica di loro (*chloræa*), leucocoryne, and other herbs.

Near the line, a new change comes over the face of nature. In the neighbourhood of Lima, towards the interior, epiphytal orchideous plants just begin to exist; plants which, as we advance to the southward, become the most singular feature of the flora, on account of their enormous numbers. In the mountains beyond the line in New Granada, between the level of the sea and eight or nine thousand feet above it, are found the forests that contain the rare cinchona trees, the rind of which, called the Jesuit's bark, is perhaps the most precious medicinal production of the New World. With these grow the Winter's bark-tree, gaily-marked flowers called Alstromerias, Fuchsias with enormous blossoms, and many kinds of oaks.

Of the remainder of the American coast to the north but little has been published; and what we have to state is chiefly collected from private sources of information. In all this part, as little similarity in the vegetation to that of the eastern side of the dividing ridge exists as in the southern hemisphere. Northern California approaches it the most, but even here the distinction is most obvious. Various species of calochortus, numerous currants with richly-coloured flowers, and especially great numbers of polemoniaceæ of unknown kinds, are characteristic forms; pines also, similar to those of Mexico, again appear on the hills, and perennial lupins begin to abound; the latter are so much increased in the north-west country, as to become a distinctive feature of the region; with these are mixed a remarkable plant called Clarkia pulchella, and many kinds of Pentstemon. The shrubs are berberries with pinnated leaves, *Gaultheria Shallon*, and more of the gay-flowered currants; and the trees number among them the broad-leaved sycamore (*Acer macrophyllum*), with firs and pines rising to a height exceeding two hundred feet. What is very remarkable, the species are more like those of Siberia than of the United States, and the most characteristic forms of the latter region are altogether wanting; no azaleas nor magnolias, few oaks, not a Kalmia, nor a walnut, nor a hickory have been observed; and even the asters themselves, which are the very weeds of the eastern side, are comparatively rare and of peculiar species. The spruce firs of the eastern side do not seem to exist on the western, but their place is occupied by the *Abies Douglasii*, which is found on the mountains at various elevations, dwindling at last to a mere bush. [See ABIES, p. 32.]

VII. POLITICAL DIVISIONS.—North America is politically divided into the republics of the UNITED STATES and MEXICO, the British possessions, and the countries still possessed by native tribes.

The more northern regions consist principally of the north-western coast discovered by the Russians, and called Russian America; the region continuous with Greenland called North Devon; the North Georgian Islands, and the countries west of Lancaster Sound in the Icy Sea; the country about Hudson's Bay, the east part of which is termed East Maine, and the western districts New North and South Wales; the north-east side called Labrador, or New Britain, inhabited by Esquimaux similar to the Greenlanders; and Greenland subject to Denmark. The population of these regions is not known with any sort of accuracy. The inhabitants neither of these, nor of the western and central regions, still occupied by aborigines, fall properly within the limits of a political description.

The provinces immediately under the British government in North America are bounded on the north by the Hudson's Bay regions, and on the south by the United States. They comprise the provinces of UPPER CANADA, and LOWER CANADA, NEW BRUNSWICK, NOVA SCOTIA, CAPE BRETON, PRINCE EDWARD'S ISLAND, NEWFOUNDLAND, with LABRADOR and the island of ANTICOSTI. Quebec is the residence of the captain-general of all British America. The extent of these possessions, in square miles, is about 2,360,000, and the present population may be computed at 1,350,000.

The republic of the UNITED STATES of America extends from the British possessions to the Gulf of Mexico, and from the Atlantic to the Great Pacific Ocean. Its southern boundary on the Pacific is the parallel of 42°, and its northern, according to American authorities, the parallel of 51°. It consists of twenty-four states, and three territories not enjoying the full rights of states. Washington, in the District of Columbia, is the seat of the federal government. Extent, about 2,257,300 square miles; population, above 13,000,000.

The present republic of MEXICO, extending from the sixteenth to the forty-second degree of north latitude, comprises about 1,639,000 square miles, and perhaps about 8,000,000 of inhabitants. It was formerly under the dominion of Spain, and comprehended the two Californias, and the intendencies of Mexico, Puebla, Vera Cruz, Oaxaca, Merida, Valladolid, Guadalaxara, Zacatecas Guanaxuato, San Luis Potosi, Durango, and Sonora, and the provinces of New Mexico, Cohahuila, and Texas. It now consists of nineteen states and four territories or provinces, and a federal district.

The republic of GUATEMALA, or Central America, formerly Spanish, situated to the South of Mexico, comprises 206,000 square miles. It consists of five states.

South America comprises the following states:—

The most northern part, lately COLOMBIA, but more recently divided into the three republics of NEW GRANADA, VENEZUELA, and ECUADOR. The territory of each is not exactly ascertained, but the extent of the three states may be taken at about 1,290,000 square miles, and the population about 3,000,000. They were formerly Spanish colonies.

To the south of these, extends, along the western coast, the republic of PERU, formerly Spanish. It contains about 600,000 square miles. Its chief city is Lima.

The republic of BOLIVIA, formerly Spanish, lies to the south of Peru. It contains perhaps about 320,000 square miles.

More to the southward is the republic of CHILI, formerly Spanish, covering 130,000 square miles.

The United Provinces of LA PLATA lie between the two last-mentioned states and the Atlantic Ocean. They perhaps contain 700,000 square miles. The chief town is Buenos Ayres.

The empire of BRAZIL, formerly a Portuguese possession, is the principal South American state washed by the Atlantic. It perhaps contains near 3,000,000 square miles. The metropolis is Rio Janeiro.

The republic of BANDA ORIENTAL, or Republica Oriental de l' Uruguay, lying immediately to the south of Brazil, with an extent of about 220,000 square miles.

PARAGUAY, watered by the Paraquay, and lying southwest of Brazil, comprises about 148,500 square miles.

It should be borne in mind by the reader, that all these estimates as to the areas of such extensive countries are very uncertain, and little reliance should be placed on them. Authorities often differ very much. The estimates of the population are still more vague, and in general are a mere guess.

GUIANA is a tract of country on the north-eastern coast, to the north of the river Amazon. It comprehends the British possessions of DEMERARA, ESSEQUIBO, and BERBICE, the French possession of CAYENNE, and the Dutch colony of SURINAM.

Patagonia is situated in the southern part of America, beyond the 46th degree of south latitude. The Straits of Magalhaens divide it from the island of Tierra del Fuego, which, like Patagonia, is inhabited by native tribes, and is very little known. The population of these countries, together with those of all the islands belonging to the southern extremity of the continent, is entirely unknown.

The islands often called the West Indies, in the Columbian Archipelago, situated in the Gulf between the two continents, are also included in America. They consist of the BAHAMA Islands, the Great ANTILLES, viz., Cuba, Jamaica, St. Domingo, or Haiti, and Porto Rico; the smaller ANTILLES, viz., Barbuda, Antigua, Guadaloupe, Dominica, Martinique, St. Lucie, Barbadoes, Granada, Tobago, St. Christopher's, St. Vincent's, and Trinidad, besides a number of smaller islands. The population of the islands is about as follows: viz., of the British islands, 800,000; of the French, 253,000; of the Spanish, 707,000; of the Danish, 46,700; of the Dutch, 26,000; and of the Swedish, 18,000. The republic of HAITI perhaps contains about 1,050,000. [See ANTILLES.] The BERMUDA or SOMERS Islands form a separate group.

AMERICANISM, a term used to express some peculiarity in the written or spoken language of the inhabitants of the United States of North America. Of all the colonies of Great Britain, in which her language has been planted, the United States are yet the only parts that have been separated from the mother country, and have attained political independence. In consequence of the rapid increase of their population, the diffusion of education, and the springing up of a numerous body of native writers, we see a new phenomenon in the history of the world of two great nations separated by a wide ocean using the same language. To preserve this language in its purity, as far as its essential character is concerned,—to introduce no new words but such as experience shows to be necessary,—to form them on true principles of analogy, and to give to them precise and definite meanings;—these are objects of equal importance to the two nations; for the preservation of a common language is a bond of unity and one of the great elements of civilization. The mother country may yet claim, and perhaps her claim will be allowed by some Americans, the privilege of a very rigid examination of American importations, before she allows them to be current coin of the realm; but to attempt to reject all new words that America produces would be both absurd and ineffectual. New wants and new circumstances are the parents of new terms, which, perhaps, increase quicker there than in an old country. The main differences between the spoken and written English language as it exists in America and Great Britain appear to be the following:—pronunciation; the use of words now obsolete in England, or used in different senses; the use of words in various parts of America as they are still used in various provinces of England; and new words.

In pronunciation, there is much greater uniformity in the United States than in Great Britain, and the general standard is certainly higher. In many parts of America, such, for example, as Philadelphia, the pronunciation is at least as good as in any part of the British dominions. But still there are differences very perceptible when we compare the natives of two remote parts; and if we take into account the wide spreading of the American nation, the great influx of foreigners, the entire absence of good education in some newly-settled parts, and the want of a metropolis to fix anything like a standard of pronunciation, we think it will appear probable that the pronunciation may in time differ widely in different parts. The rapid communication from one part to another will help somewhat to check this tendency. The Americans generally sound the *h* more strongly than the English in such words as *house*, and also in such words as *neighbourhood*, and very rarely commit the fault so common in England, of *hasking* for *heggs*. Yet we know there is a small district, and there may be more, where the people retain this *shibboleth* which marks them as the descendants of a colony from the neighbourhood of London. The articulation of the Americans is generally slower than that of the English, and sometimes drawling, but certainly much more distinct.

As to the use of words now obsolete in England, they are mainly confined to conversation, for every one is aware that there is very little in the style of a good American writer, except perhaps a greater degree of ornament, by which we can distinguish it from that of a good English writer. But as the Americans write a great deal in public journals, and are the most prolific people in the world in producing inaugural speeches, orations, and all the various modes of addressing an audience, we should look at that part of their language in order to form a complete judgment of its whole condition, as well as at those specimens of composition which are of a less showy but more valuable and permanent nature.

The number of words now used in a different sense from that which they have in England is but small among writers of *good* authority; the list of those used in conversation would be somewhat larger. We have heard the word *shew* used as the past tense of the verb to *show*; the form is now obsolete in England, but may be found in our older writers. In some parts, (for we are aware that in so extensive a country scarcely any remark of this kind can be general,) the word *balance* in the spoken language is employed to express the *remainder* or *the rest*: thus people speak of 'the balance of the professors,' meaning 'the rest of the professors.' The word *mutton* is sometimes used, as it once was in England, to signify a sheep. Dr. Webster remarks, that this sense is obsolete or ludicrous: it is not either obsolete or ludicrous in the spoken language of some districts. The word *bug* is used (see Webster) in its original sense of a *fly*; and the old verb *prógress*, which the Americans use very often and pronounce *progréss*, is now beginning to be again adopted in its native country, though we think we could very well do without it. In judging how far words used in America in different significations from what they have in England, have been sanctioned by authority, and established in the written language, we cannot, perhaps, take a better guide than Dr. Webster's *Dictionary;* and we shall find the number by no means small. Cooper, in his '*Mohicans*,' speaks of a 'lake having *flowed* its usual banks.' Webster sanctions this usage under a transitive sense of the word *flow*, which he makes equivalent to *overflow*. (See Webster's *Dictionary*, under *flow;* and the example.) Against this usage we take the liberty of protesting. In the *National Intelligencer*, March 2, 1826, we find,—'for providing a jurisdiction *convenient* to the scene of almost all the shipwrecks:' this English-provincial and Irish use of *convenient* in the sense of *near*, is properly omitted by Webster. The verb *rent* has the double meaning in Webster of *granting on lease*, as a proprietor does, and *taking on lease* as a tenant does. *Nullification* is not in Webster, but has been defended on the ground of analogy, and by a reference to the use of *nullify* in Flavel. The usage of the word *locate* is familiar to all who read American papers or public documents: we say 'that a man *has located*, i. e. has selected, surveyed, and marked out—a hundred acres in Alabama.' The word *expect* is often used in a strange sense in some parts of America, but certainly nearly altogether in conversation, as in the following instance given by Webster: 'I expect it was.' The American lexicographer justly condemns this usage, which is of provincial English origin. The word *lengthy* some critics object to as being of American origin; we rather doubt if it is. Still it is a good word, well made, and well adapted to express the wearisomeness of listening to a long speech or discourse of any kind: we presume that in this, as in some other instances, the Americans did not call the word into use till they felt the absolute necessity of it. For other American usages which are somewhat peculiar, the reader may refer to the following words in Webster: to *wagon* (*waggon*); *stud-horse; subserve; clever* (Webster's account of the English use of this word is incomplete); *notify; graduated*, &c. The American uses of *creek, girdle, section*, &c. may be seen in Webster. *Fivebar*, in Webster, for five-barred, is a mere vulgarism. Mr. Pickering, in a work published at Boston in 1816, has traced a great number of words and phrases which have been considered as Americanisms to the counties of the mother-country; we recollect one word at present, which we can only trace to Holland. In Virginia, *waffel-cakes* are often made; a similar cake with the same name, waffel, is very common in Holland.

As to new words, the number used in the written language is not great. The word *bindery*, meaning 'a place where books are bound,' is in Webster. We believe it is a new, but it certainly is not a bad word. In American advertisements we observe the word *book* is generally prefixed; thus we might say, a *book-bindery*. *Sparse* is, for any thing we know, a new word, and well applied; the Americans say a *sparse* instead of a *scattered* population; and we think the term has a more precise meaning than scattered, and is the proper correlative of *dense*. The danger of new words is, that the ignorant will use them without knowing their meaning, as we may observe in some of the inferior American newspapers. The number of new words that may be gradually creeping into the American spoken language, we suspect, is not inconsiderable; this arises in some measure from intermixture with foreigners, and must produce some effect though it may not be much. We have heard the German word *plunder* vulgarly applied to baggage or heavy commodities.

We suspect that many words of a moral import are beginning to vary considerably as to the signification attached to them in England and America. *High-minded*, a word not much used in Great Britain, rather implies something elevated or noble in *enduring:* in the conversation language, at least, of some parts of America, it is applied as a term of praise to *action*, often impetuous, and sometimes unjust. *Lady* and *Gentleman* are terms that come under the same predicament, as to difference of import.

The orthography of the English language is liable to more change in America than in England: the Americans, as a general rule, do not observe orthography so strictly as the English, of which any reader of American papers may convince himself. We refer to American newspapers, because they are, more than in England, used as a common medium for addressing the public on all subjects, and form a large part of the reading of the community.

We have said nothing of *style*, or the character of American writing as distinguished from English, as this lies beyond the proper subject of the article. The main difference appears to us to arise from the superior value attached in America to oratorical display, and to the opinions there very commonly entertained about what is called fine writing, and eloquence. [See STYLE, ELOQUENCE.]

AMERIGO VESPUCCIUS. [See VESPUCCI.]

AMERKOTE, a town near the eastern frontier of Sinde, and about eighty-five miles to the eastward of Hyderabad, in that province. It is in 25° 20′ north lat., and 69° 49′ east long. This town is celebrated as having been the birthplace of the Emperor Akbar, when, in 1541, his father Humayun was driven from Hindostan by Shere Khan, the regent of Bahar. Amerkote was once the capital of an independent district in the south-eastern quarter of Mooltan, under which latter name was formerly comprehended the whole of Sinde; in 1813 it was captured by the Ameers of Sinde. The country by which it is surrounded being barren, yields nothing to the public revenue, which is derived from duties on merchandise, and exactions from travellers who pass through. (Mill's *History of British India;* and Hamilton's *East India Gazetteer.*)

AMERSFOORT, a town in the province of Utrecht, twenty-five miles E. S. E. of Amsterdam, on the small navigable river Eem, which runs into the Zuider Zee. This town is situated at the foot of a small hill called Amersforderberg, in a very pleasant district. The extensive tobacco plantations around this place are much decreased, but the town has still some tobacco manufactures, cotton fabrics, and a glass-house. The population in Jan. 1, 1830, was 5585 males, and 6197 females. Amersfoort has three churches, one of which is a fine building. The Grand Pensionary Barneveldt, who was so unjustly executed at the Hague, in 1619, was a native of this town. Amersfoort was taken by the French in 1795.

In traversing the flat country from Utrecht to Amersfoort, and approaching the latter town, we observe a district of heath five or six miles long and as many broad, with some few trees on it, and dunes or hills of small elevation. These sandy hills contain fragments of quartz sometimes rounded, but for the most part angular, with pieces of rock of a schistose structure, containing a good deal of sand. The whole mass appears to have been brought down by the action of water from the upper course of the Rhine. These hills are sometimes called the Amersfoort Hills, and in their character are similar to the BELUWE or Welawe, a few miles farther to the east.

AMERSHAM or AGMONDESHAM, a borough town in Buckinghamshire, about twenty-six miles W.N.W. of London, on the road to Aylesbury and Buckingham, from which last it is distant thirty-three miles. It is in a valley between woody hills, near the river Coln, and consists of one main street, long and wide, not lighted but well paved, and crossed by a smaller one. The church stands near the point of intersection, and is a spacious building of brick covered with stucco: it consists of a nave with small aisles, transepts, chancel, monument room for the Drake family, in which are some handsome monuments, and a tower at the west-end. It is dedicated to St. Mary; and the living, a rectory in the gift of the Drake family, is accounted one of the best in England. The town-hall (the lower part of which is used for the market) is a brick building, near the centre of the town, raised upon pillars and surmounted by a lantern and clock: it was built by a Sir William Drake, who died in 1682. With these exceptions the town contains scarcely any building worthy of notice.

The manufactures are chiefly of black lace, cotton, straw-plait, and wooden chairs. The market is on Tuesday; there are two fairs, one on Whit-Monday, and another on the 19th September. The population of the borough and parish in 1831 was 2816, without reckoning (as it seems) the hamlet of Coleshill, which, though partly in this parish, is in the county of Herts.

Besides the parish church, there are two places of worship; one for Baptists, and one for Quakers. The grammar-school was founded by Dr. Robert Chaloner, rector of Amersham, and Canon of Windsor, who endowed it with 25*l.* per annum. Dr. Chaloner died in 1621. A writing school was endowed by Lord Newhaven (who died in 1728); and a Sunday-school, previously established by subscription, by the late William Drake, Jun., Esq. An almshouse for six poor widows was endowed by a Sir William Drake, Bart., who died in 1669.

Amersham was a parliamentary borough by prescription; but its right to send members was disused for four hundred years, till, in 1623, it was restored on petition. Edmund Waller, the poet, and Algernon Sidney were members for this borough. It was disfranchised by the late Reform Bill.

Many of the inhabitants suffered as Lollards in the reign of Henry V., or as Protestants in that of Mary I.

AMES (JOSEPH) was the son of Mr. John Ames of Yarmouth, where he was born on the 23rd of January, 1689. His father appears to have afterwards settled in London, where he died when his son was in his twelfth year. At this time he was at a little school in Wapping. When fifteen, he was put apprentice to a plane-maker, either in King or Queen Street, (near Guildhall) in the city of London. Having served out his time, he then settled in Wapping, Horace Walpole says as a ship chandler; but according to other accounts, as an ironmonger. Whatever was his business, he seems to have pursued it with success, and to have attained by it, if not wealth, at least a competency. He also found time to supply the defects of his early education by reading; and this led at length to authorship. The study to which he was most attached was that of antiquities, and particularly those of his own country. He had formed an acquaintance with the Reverend John Lewis, the author of the *Antiquities of the Isle of Thanet*, and many other works, who lived for some time in Wapping; and it is this gentleman who is said to have first suggested to him, about the year 1730, the preparation of a history of English printing. Some circumstances prevented him from engaging in the project till two years after; but he then took it up in earnest, and its execution became the object of his life. The work, in a quarto volume of above 600 pages, appeared in 1749, under the title of '*Typographical Antiquities; being an Historical Account of Printing in England, with some Memoirs of our Ancient Printers, and a Register of the Books printed by them, from the year* 1471 *to* 1600; *with an Appendix concerning Printing in Scotland and Ireland in the same time*.' This is Ames's principal work, and still, indeed, serves as the basis of the only elaborate history we have of English printing. It has probably preserved a good many title-pages, and other facts connected with its subject, that would have been lost, had the recording of them been longer deferred; and it is, upon the whole, creditable to the industry of its compiler. But the task, to be well performed, required much more learning than Ames possessed. The most valuable part of his book has been added to it by its subsequent editors, and especially by Mr. Herbert, whose edition, extended to three volumes quarto, appeared in 1785, 1786, and 1790. A still more augmented, and much more splendid edition has been since published by the Reverend Dr. Dibdin, in four vols. 4to., 1810-12. Ames's next most considerable work is that entitled *Parentalia, or Memoirs of the Family of Wren*, fol. 1750. The book bears to be 'by Stephen Wren, Esq.' (the grandson of Sir Christopher) 'with the care of Joseph Ames;' but Ames is understood to have been really the writer. He is also the author of a Catalogue of English heads, 8vo., 1748—of a Catalogue of English printers, in two leaves 4to., and of an Index to the catalogue of Lord Pembroke's coins, printed, but not published. Mr. Ames was a fellow of the Royal and Antiquarian Societies, and secretary to the latter from 1741 till his death. In the *Philosophical Transactions* for 1747, is an account of a case of Plica Polonica, or matted hair, communicated by him. (No. cccclxxxiii. p. 556.) He died suddenly in the shop of a friend, an ironmonger, in St. Clement's Lane, on the 7th of October, 1759. He left a considerable collection both of books and of antiquities and other curiosities, which were sold by auction after his death; the sale occupied nine days. The above facts are taken from the *Life of Ames*, by the late Mr. Gough, first prefixed to Herbert's edition of the *Typographical Antiquities*, and since republished with additional notes in that of Dr. Dibdin.

AMESBURY, a market-town in Wiltshire, in a valley on the river Avon,[*] about seven or eight miles N. of Salisbury, and seventy-eight W.S.W. from London. Its population is small, the parish having only 944 inhabitants in 1831. The town has little trade, and is chiefly supported by travellers and posting. Even the market (which was on Friday) has been discontinued. There are three fairs. Amesbury consists of two streets, irregular and ill-built, neither paved nor lighted. The church, built of stone and flints, is of very early date, but some of its antient features have been defaced by alterations. It was probably attached to the nunnery which once existed here. The living is a perpetual curacy, in the gift of the Dean and Canons of Windsor. There is a Wesleyan chapel, and several schools, one of which is a national school.

Amesbury is a place of great antiquity. Under the Saxon king Edgar, it was of sufficient importance to be the seat of a synod; and Elfrida, the widow of that prince, founded here, in the latter part of the tenth century, a nunnery of the Benedictine order. An abbey had indeed existed at a much earlier period, founded, as some say, by Ambrosius, a British prince who lived at the time of the Saxon invasion, or by one Ambri a monk: this abbey appears to have been destroyed by the Danes about the time of Alfred. Elfrida's nunnery, notwithstanding some changes, lasted till the general dissolution of the religious houses. Its revenue at that time is estimated by Speed at 558*l*. 10*s*. 2*d*., and by Dugdale at 495*l*. 15*s*. 2*d*. A mansion on its site, was, after the French Revolution, occupied by some nuns from Louvain, attracted it is said by the sanctity of the place: they subsequently removed into Dorsetshire. In its neighbourhood is STONEHENGE. To the west of the town are the traces of an antient encampment, which though popularly termed Vespasian's camp, is evidently not of Roman origin.

AMETHYST. This name has been applied to two precious stones of essentially different natures. The *oriental* amethyst is a rare variety of ADAMANTINE SPAR, or corundum, as already noticed; the *occidental*, or *common* amethyst, now to be described, is a variety of quartz or rock crystal, which is met with in many parts of the world, as India, Siberia, Sweden, Germany, Spain, &c. It occurs in various forms, as massive, in rounded pieces, and crystallized; the primary form of the crystal, like that of quartz, is a slightly obtuse rhomboid, but it is usually found in the secondary form of a six-sided prism, terminated at one or both ends by a six-sided pyramid; sometimes, though rarely, the prism is wanting, and the pyramids being then united base to base, the secondary crystal is a dodecahedron with triangular faces.

The amethyst is principally distinguished from common quartz by its colour, which is occasionally of every shade of violet, or rather purplish violet, and this in the perfect amethyst is pretty equal throughout the crystal; very commonly the summits only of the crystal are amethystine, the lower part being nearly colourless, or tinged with green. By long-continued heat the colour is destroyed, and the crystals become white and opalescent. Sometimes the crystals are aggregated or fasciculated; in the Palatinate they are found lining geodes of agate, and in Silesia capillary crystals occur mixed with micaceous iron ore.

The crystals of the amethyst vary from diaphanous to translucent, and they exhibit various degrees of splendour, both externally and internally. The fracture is commonly conchoidal, and the fragments are of indeterminate form. Like quartz, the amethyst is sufficiently hard to give fire with steel and to scratch glass; and has also been found, like it, with cavities containing water; it is infusible by the common blow-pipe. According to Rose, it consists of—

Silica	97·50
Alumina . . .	·25
Oxide of iron and manganese	·50
	98·25

AMHARA, the name of one of the great divisions of the Abyssinian empire (see ABYSSINIA); but properly the name of a province. Beyond the information derived from the visits of the first Portuguese missionaries to this province, it has remained unknown. We find the first account of it in the *Journey* of Alvarez, who, in 1520, travelled from Arkeekoo, through Tigre and Angot, into Amhara. His description, though it gives no very exact account of the direction of his route or the distance of one place from another, contains a great deal of curious information. Soon after entering Amhara, Alvarez saw a lake three leagues long and one wide, with an island in the middle, on which was a monastery of St. Stephen. The monks gathered abundance of lemons, oranges, and citrons. The lake contained *gomaras*, or hippopotami. Alvarez mentions various other smaller lakes in Amhara. Numerous *sierras* traverse the country, some rising abruptly from the level plains, but well cultivated at the top, and sown with various kinds of grain. He describes many well-cultivated plains covered with maize, wheat, barley, and in some cases carefully irrigated. The country contained a great many Christian churches; indeed every district had its church. The people in some places went nearly naked.

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[*] There are two rivers of this name in Wiltshire. The one here mentioned passes by Salisbury.

The missionary describes some most singular and dangerous passes formed in the side of mountains: from many parts of the country to other parts there seems to be only one road, on which there were occasionally gates placed, which entirely commanded the passes; certain duties were levied at these gates.

At the period of Alvarez's visit, the emperor appears to have chiefly resided in Amhara. The great changes that have happened in Abyssinia since that time have, probably, rendered this province difficult of access. We find no information about it in the *Life and Adventures of N. Pearce* (London, 1831).

It will be observed that Alvarez mentions the orange and lemon as being in Abyssinia at the time of his visit. The received notion is, that the fruits of this class are indigenous in the eastern parts of Ava and the north of India; they may, possibly, be indigenous in Abyssinia also. Lobo says, that the Abyssinians have black grapes, peaches, some pomegranates, the sugar-cane, and the fig; but he says nothing about oranges and lemons. According to Bruce and Pearce, the orange and lemon are now in Abyssinia, but when introduced we do not know. [See ALVAREZ.]

AMHA'RIC LANGUAGE has its name from Amhara, where it is or was spoken in its greatest purity. Inferior dialects of the Amharic are spoken in the provinces of Gojam, Angot, Efat, Shoa, Bagemder, Samen, &c. The Amharic is supposed to be mentioned by Agatharchides, (*Hudson, Geogr. Min.*, t. i., p. 46,) about 120 years before Christ. Agatharchides calls the language of the Troglodytes of Ethiopia Καμάρα λέξις, a term which certainly bears some resemblance to *Amharic*. Agatharchides says that he was acquainted with the Kamara. The Amharic began to prevail in Abyssinia over the Geez language when Icon-Amlak, about the year 1300, having overcome the Zagæan dynasty, ascended the throne of his ancestors, and removed the residence of the royal court from Axum to Shoa, where he had lived in exile. Younger princes were usually confined in the mountain fortresses of Amhara, Goshen and Ambaçel. Icon-Amlak surrounded himself with officers and courtiers who spoke the Amharic, which was then generally adopted by the higher ranks in Abyssinia, who called it *Lesana negus*, the royal tongue. A knowledge of the Amharic enables a traveller to make himself understood in nearly every part of Abyssinia, although there are numerous dialects, of which no complete classification has yet been accomplished; of these the Tigré resembles much more the antient ecclesiastical Ethiopic or the Geez language, than the Amharic. The Arabian writer Makrizi counts fifty dialects. It will be probably quite as difficult to define the exact number of Ethiopian, as of Arabic, modern Greek, and English dialects, or the number of languages in general. The king of Abyssinia, his councillors, ecclesiastics, monks, and every well-educated Abyssinian, know the Geez language, in which documents and letters are usually composed. Therefore the *Geez* is called *lesana matzhaf*, or *metzhafeña*, that is, the language of letters or books. The foreign correspondence of the king is in Arabic. According to Bruce, there was a law, that whoever should dare to translate the Holy Scriptures from Geez into the Amharic should die; but this law has not been strictly observed.

The British and Foreign Bible Society have published a *Psalterium Davidis Amharice*, London, 1833, large 18mo., price 2*s.*; and *Novum Testamentum in Linguam Amharicam, vertit Abu Rumi Habessinus; edidit Thomas Pell Platt*. Londini, 1829, foolscap 4to., calf, 12*s*. The whole Bible is now preparing for the press under the superintendence of Mr. T. P. Platt, late Fellow of Trin. Coll., Cambridge. The New Testament and the Psalms have been circulated by Mr. Gobat and other missionaries in Abyssinia, and have been sometimes transcribed by the natives who could not be provided with printed copies. Mr. Gobat returned from Abyssinia in 1833.

The circumstances which enabled the British and Foreign Bible Society to obtain a translation of the whole Bible into the Amharic language are detailed in their reports, and in the *Christian Researches in the Mediterranean from* 1815 *to* 1820, *by the Rev. W. Jowett*, pp. 197-213.

The Amharic is said to be a degenerated Shemitic dialect, the grammatical structure of which has preserved its character, though its lexicographical contents are mingled with African words. It is likely that the Amharic and other dialects of the Ethiopic are derived from the old Arabic of the Himyarites in Yemen. The Amharic adds to the twenty-six characters of the Geez seven others, which are mere modifications in order to express some characteristic sounds. The vowels are expressed by variations in the shape of the letters, so that each character or letter is in fact a syllable, being a consonant followed by a vowel, thus: *lă, lé, lî, lâ, lû, lĕ, lo*. The Amharic, with other Ethiopic dialects, is written from the left to the right hand, like our western languages.

Amharic literature is very scanty. Before the above publications of the British and Foreign Bible Society, there were in Abyssinia no Amharic books, except an Ethiopic-Amharic vocabulary, called *Sausau*, or the ladder. Ludolf's *Grammatica Amharica* contains a translation of Luke xi., 1-13, a confession of faith, some colloquial phrases, and a little poem in Amharic. The manuscript of Ludolph's translation of thirteen verses of St. Luke is preserved in the University library at Giessen. There is also a *Catechesis Christiana, Lingua Amharica*, by T. G. Ghbragzer, Romæ, after 1786. Ludolf was assisted by J. H. Michaëlis in the composition of his *Lexicon Amharicum* and his *Grammatica Amharica*. Ludolf derived his knowledge of Amharic chiefly from Abba Gregorius, a native unlearned Abyssinian, who merely drew up a rough Italian-Amharic vocabulary, which came afterwards into the library of Paris.

The French consul at Cairo, Asselin de Cherville, caused Abu Rumi, an old Abyssinian, who had been the instructor of Bruce and Sir William Jones, to translate the whole Bible into Amharic. This is the translation which is now in the possession of the British and Foreign Bible Society. M. Asselin was also engaged on an Amharic grammar and dictionary. (*Magasin Encyclopédique*, tome v. p. 197, &c.) M. Asselin devoted, during ten successive years, two days per week to the superintendence of Abu Rumi's translation.

No. XIV. of the Abyssinian manuscripts, in the library of the British and Foreign Bible Society, contains the Gospel of St. Mark in Amharic, by Pearce. Pearce, who is well-known from Salt's *Travels* and the recent publication of his life, was unacquainted with the Ethiopic characters; and has therefore expressed the sounds with which he was familiar in the common English handwriting and orthography. His attempts are sometimes a little amusing. Instances occur of as great deviations from the correct form, as if we should represent the French words, *il faut que*, by the combination *elfoker*. The reader will find some useful remarks on the subject of the Amharic translations, by T. P. Platt, Esq., in his work, intitled *A Catalogue of the Ethiopic Biblical Manuscripts in the Royal Library of Paris, and in the Library of the British and Foreign Bible Society; also some account of those in the Vatican Library at Rome. With remarks and extracts. To which are added Specimens of Versions of the New Testament into the modern Languages of Abyssinia: and a Grammatical Analysis of a Chapter in the Amharic Dialect: with fac-similes of an Ethiopic and an Amharic Manuscript*. By Thomas Pell Platt, B.A.: London, 1823. 4to. It appears that Pearce deviated from analogy in his orthography, frequently made grammatical errors, and violated the idiom of the language in attempting to render each word and particle of the English version from which he translated. In Pearce's Amharic version, there is scarcely a copulative or disjunctive particle in a whole chapter, not even the conjunction *and*. Abu Rumi's translation renders it likely that Pearce did not know certain forms of expression which should have been introduced. Perhaps in the rapidity of colloquial communication, many characteristics of particular inflexion may be lost, and so have been omitted by Pearce, whose translations, however, are valuable as expressing the native pronunciation. Pearce died at Alexandria.

Ludolf's Ethiopic types have been obtained from Germany for the use of the British and Foreign Bible Society; and the wish, repeatedly expressed by Ludolf, of promoting by linguistic studies the propagation of the Gospel, has been fulfilled after the lapse of more than a century. Various characters of Ludolf's types were altered under the direction of Professor Lee, to a nearer imitation of Ethiopic calligraphy.

Little collections of Amharic words have been made by

Salt in his *Travels*, and by Seetzen in his *Linguistischem Nachlasse*, Leipzig, 1816-18, p. 145, &c. Nine verses of the commencement of Solomon's Song, in five dialects, similar to the Amharic, may be seen in Bruce's Travels. (See the article *Amharische Sprache*, by Gesenius, in Ersch and Gruber's *Encyklopädie*; and see Ethiopian Languages.)

AMHERST, a small town of Massachusetts, about seventy miles due west of Boston, and a few miles east of the Connecticut river. It has an incorporated college which opened in 1821. The latest accounts state that it had a president, ten instructors, 197 students, a library of 2380 volumes, and a student's library of 4515.

AMHERST, a town in the north-east angle of the Gulf of Martaban, in 16° 5′ N. lat., and 97° 25′ E. long.

This town was built by the British in 1826, on the termination of the Burmese war, in order to supply the place, as a military post, of the town of Martaban, which was restored to the Burmese under the provisions of the treaty. In this town an asylum was offered to such of the Burmese subjects as dreaded the resentment of their government for the part they had taken during the war. The place was named in honour of the Governor-General of India. It may afford some idea of the rapidity with which towns are raised in India, to state, that in the beginning of April, 1826, the spot selected as the site of this town was covered with jungle, and that in the following January it contained 1600 inhabitants.

The situation of Amherst appears to be well chosen for the purposes of commerce, it being easy of access to the Burmese, the Chinese, and the people of other countries beyond the Ganges. The run by sea between this place and Rangoon is short, and suited to the small vessels employed by the Burmese in their coasting trade. On the land side, there is a safe route to the interior of Ava, and to the country of the Shans, a people inhabiting the central region between Ava, Siam, and China. The practicability of this route for the introduction of merchandize into China was early established, by the transmission, in 1827, of several chests of opium.

The town is built on the south bank of the wide outlet, or æstuary of the Saluen river, which passes from China through the Shan country, and discharges itself into the gulf of Martaban. The channel of this stream is broad, but so shallow, and so much obstructed by shoals and rapids, that, except at its mouth, it is not navigable for vessels of any considerable burthen. Its course lies through an open and fertile country.

Amherst is a bar harbour with rather a dangerous entrance, but when this is passed, the anchorage is good in five fathoms water, within 100 yards of the shore. The bar has only one fathom at low water. The tide flows about six miles an hour, and its greatest rise is 19 feet. For two hours before, and the same time after high water, the harbour is so still, that the communication with the shore is perfectly easy.

Good water is found everywhere in the neighbourhood of the town, within six feet of the surface, and every circumstance connected with the station seems to promise that Amherst will become a place of considerable commercial and political importance. The military cantonments are situated about a mile and a half from the town, on a dry and elevated spot. (*Manuscripts of the India Board, quoted by Hamilton, and Reports of the House of Commons on the Affairs of India*, 1832.)

AMHERST (JEFFERY, BARON), a distinguished British military commander, was the son of Jeffery Amherst, of Riverhead, in Kent, Esq., and was born on the 29th of January, 1717. The family is said to have been of great antiquity. He received his ensign's commission in 1731, and having some years after gone to Germany as aide-de-camp to General Ligonier, was present at the battles of Dettingen and Fontenoy. He afterwards became aide-de-camp to the Duke of Cumberland, and as such was present at the battles of Laffeld and Hastenbeck. In 1756, while still abroad, he received the colonelcy of the fifteenth regiment of foot. Two years after he was recalled from the continent and sent to America as major-general of the troops destined for the siege of Louisburg in Cape Breton. After the reduction of Canada in 1760, to which he had materially contributed, he received the thanks of the House of Commons, and was made a Knight of the Bath. Soon after he was appointed commander-in-chief of all the forces in America. On the peace in 1763 he returned to England, when he received from the king the governorship of Virginia. A misunderstanding with his majesty in 1768 occasioned his sudden dismissal from the army; but the matter having been cleared up, he was in a few months reinstated both in his former rank and in the royal favour. In 1770 he was made governor of Guernsey, and two years after, lieutenant-general of the ordnance and commander-in-chief of the forces in England. In 1776 he was created Baron Amherst of Holmesdale, in the county of Kent. He retained his appointment of commander-in-chief till the breaking up of the North administration in 1782, when, on his resigning it, the king gave him the office of gold stick in waiting. In 1787 he received a second patent of nobility with the title of Baron Amherst of Montreal in Canada, and with remainder to his nephew. On the 22d of January, 1793, he was again appointed to the command of the army, which he held till the 10th of February, 1795, when he was succeeded by the Duke of York. On this occasion it is understood that an earldom and the dignity of field-marshal were offered to him, both of which honours he declined at the time, though the following year he accepted the field-marshal's baton. Lord Amherst died at his seat at Montreal near Sevenoaks, Kent, on the 3d of August, 1797, in the eighty-first year of his age. He had been twice married, first to Jane, daughter of Thomas Dalyson, Esq. of Manson, in Lincolnshire, who died on the 7th of January, 1765; and the second time to Elizabeth, daughter of General Cary, and grand-daughter of Lucius Henry, Viscount Falkland; but he left no children, and was succeeded in his title and estates by his nephew, William Pitt Amherst, the present peer. (*Gentleman's Magazine* for 1797, p. 800; and Chalmers's *Biographical Dictionary*.)

AMHERSTBURGH, a town in the western district of Upper Canada, in 42° 5′ N. lat., and 83° 10′ W. long., in the township of Malden, Essex county.

Amherstburgh stands on the northern shore of Lake Erie, near the mouth of the river Detroit, and on its eastern side. Being a frontier town, it has some military defences and contains a garrison. During the war with America in 1813, the military and naval works were destroyed on the approach of a superior American force, but they have been partly restored since the peace. There is a very safe and commodious harbour, with a good anchorage in three and a half fathoms water.

The surrounding country is highly fertile, and the climate good. Apples, pears, peaches, plums, nectarines, and grapes, are produced in great perfection and abundance. The lake and river furnish a great variety and plentiful supply of excellent fish; and the woods contain as great a choice of game and of singing birds. (Bouchette's *Account of the British Dominions in North America*.)

AMIANTHUS. [See Asbestos.]

AMIDINE, a peculiar substance, procured by Saussure from wheat and potato starch: 100 parts of the latter were boiled with 1200 parts of water, and put into a bottle furnished with a tube to convey the gases generated. After forty-two days' exposure to a temperature of 68° to 77° of Fahr., small quantities of hydrogen and carbonic acid gases were obtained. On examining the residue, it was found to contain 18·7 of amidine, 35·4 of sugar, resembling that formed by the action of dilute sulphuric acid upon starch, and 17·5 of gum, similar to that procured by roasting starch, and some starch remained unchanged. One hundred parts of potato starch boiled with 1200 of water were exposed also for forty-two days to the atmosphere; they yielded 17 of amidine, 30·4 of sugar, 17·2 of gum, and some unaltered starch.

It appears, therefore, that changes occur in the nature of starch, with, or without, the presence of atmospheric air· in the former case, it was found that a little of its oxygen was converted into carbonic acid gas; in the latter, as already noticed, hydrogen and carbonic acid gases were evolved.

When the residue of the fermentation is treated with cold water, the sugar and gum are readily dissolved, while the amidine is but little soluble in it; boiling water, however, readily dissolves it, and it is to be purified by evaporation to dryness, powdering, washing with a little cold water, redissolving in boiling water, filtering and again evaporating to dryness.

Amidine, thus obtained, is opaque, or semi-transparent, white, or yellowish-white, inodorous, insipid, very friable, soluble in any proportion in water of 140° Fahr., but insoluble in alcohol. It resembles starch in giving a blue colour with iodine, in its action upon barytes-water, subacetate of lead and infusion of galls, but differs from it in being soluble in cold water, and in not gelatinizing with boiling water, even when it forms one-fifth of the solution.

AMIENS, an antient town of France, in the department of Somme, seventy-five miles N. of Paris. It is of Celtic origin, and existed at the time of Cæsar's invasion of Gaul, under the name of Samaro-Briva, which denotes a bridge over the Samara, now the Somme. At a later period it acquired the name of the tribe of which it was the chief town, the Ambiani; this name, under a modified form, it still retains.*

When France was divided into provinces, Amiens was the capital of Picardy; and when this division was superseded by that of departments, Amiens became the capital of the department of Somme. It is the seat also of a *Cour Royale*, a court the jurisdiction of which may be compared to that of our own assize courts, but which differs from them in being stationary; of a *Tribunal de Commerce*, a court for the decision of mercantile disputes, the members of which are leading merchants or tradesmen, and are appointed by the commercial body; and of a bishopric, which includes the departments of Somme and Oise.

The town is well-built, with broad, straight streets. The river Somme, which traverses it in three branches, is navigable for small craft. There is a citadel, but the ramparts of the town have been demolished, and serve now as promenades. The chief buildings are, the town-house built by Henry IV., in which is a collection of paintings of the French school, the corn-market, the college, the residence of the prefect, and especially the cathedral, one of the finest specimens of Gothic architecture in France. The nave of this edifice, the loftiest in France, is regarded as a masterpiece; and the lightness of the pillars attracts much admiration: the effect of the whole has, however, been injured by the substitution of plain glass for the stained glass which once filled the windows. There are two fine promenades in the town.

The trade of Amiens is still considerable. Velvet, plush, camblet, quilting, serge, drugget, fine kerseymere, hosiery, and other goods, linen, cotton, and woollen, are either entirely manufactured, or, being brought in from other places in an unfinished state, are prepared for sale in other parts of the country, or for exportation to foreign lands. There are also paper-mills and bleaching-grounds. The town serves as a mart for the numerous manufactures of the neighbourhood as far as the confines of the department. The number of inhabitants is above 42,000.

Of institutions for education, or the promotion of science, Amiens possesses several. There is an *Académie*, an institution ranking with the universities of other countries, and a *Collège* or public school; a capital library of 40,000 volumes; a botanic garden, and an academy of belles lettres, sciences, and arts. It was the birth-place of Voiture, Ducange, the astronomer Delambre, and Peter the Hermit, the instigator of the first crusade.

Amiens, after having been bestowed by Charles VII. of France on the Duke of Burgundy, a prince at that time nearly equal to his sovereign in power, was re-annexed to the crown in the fifteenth century by Louis XI., the son and successor of Charles. In the time of Henry IV. it was taken by the Spaniards by a singular stratagem. A party of soldiers, disguised as peasants, driving a cart loaded with walnuts, having gained admittance, contrived to spill their nuts just by the gate; and while the guards were gathering them up, the town was surprised and taken by the disguised soldiers and their comrades who had followed them. This was in 1597; but the town was recovered within a year. The short peace between England and France, in 1802, was concluded at Amiens.

The arrondissement of Amiens contains 652 square miles, and about 160,000 inhabitants. There are in it 250 communes.

AMIENS (TREATY OF), the treaty of peace between Great Britain on the one part, and France, Spain, and Holland, on the other, signed at Amiens on the 25th of March, 1802. The preliminaries of this peace had been signed at London on the 1st of October, 1801; and on that occasion, it was agreed that the terms of the final treaty should be settled at Amiens, that town being situated about midway between London and Paris. On the 1st of November, accordingly, the Marquis Cornwallis left London for Paris, commissioned to act as plenipotentiary; and on the 1st of December he arrived at Amiens. On the 7th, the Dutch minister, Roger Jean Schimmelpenninck, made his appearance. The Spanish representative, Don Joseph Nicolas D'Azara, did not come till a considerable time after. Joseph Buonaparte was the French plenipotentiary.

It was a long time, after the commissioners had all assembled, before much progress was made in the negotiation; and it was frequently supposed to be on the point of being broken off. The treaty, however, was at last signed on the day we have mentioned—an additional article having been added two days after. On the 29th, Mr. Moore, the assistant secretary to the mission, arrived with the news in London. The proclamation of the peace was made in that city, and in Westminster, on the 29th of April, on the evening of which day a brilliant illumination testified the public joy. The treaty of Amiens consisted of twenty-three articles, including the supplementary one. France agreed to evacuate Naples, and the states of the Church; England, on her part, gave up all her conquests during the war, to the powers to whom they had formerly belonged, with the exception of Trinidad, which had been taken from Spain, and the part of Ceylon which had been possessed by the Dutch. Egypt was restored to Turkey. It was also stipulated, that within three months after the exchange of the ratifications of peace, the English troops should evacuate the islands of Malta, Gozo, and Comino, which should be given back into the possession of the Knights of St. John of Jerusalem, to be held by them on conditions which were enumerated under thirteen heads It was this last stipulation which afterwards afforded the ostensible ground for the breach between the two principal powers which had been parties to the treaty of Amiens. Hostilities were renewed between France and England by a declaration of war on the part of the latter, on the 17th of May, 1803.

AMILCAR. [See HAMILCAR.]

AMIOT, (LE PERE,) a learned French Jesuit, and a missionary to China. He was born at Toulon in 1718. Having entered the order or society, as it was styled, of the Jesuits, he distinguished himself as much by his natural talents, as by his persevering application to study, especially to mathematics, physics, and the languages. Being sent by his superiors to the eastern missions, he arrived at Macao in 1750, whence he proceeded the following year to Pekin, at the request, it is said, of the emperor, who had heard of his great proficiency in mathematics, a science then much in favour at the court of China. Father Amiot soon won the friendship of the monarch, and he continued ever after to reside at Pèkin, for the space of forty-four years, till the day of his death. To his knowledge of the Chinese, he added that of the Mantcheou language, which he studied at Pekin, under a military officer of that nation, and which, as he modestly observes, he found very useful for interpreting many obscure passages in the Chinese writers, whose language, he says, is like no other in the world, and is justly called by the Japanese 'the language of confusion.' The Tartar Mantcheou, on the contrary, is methodic, and better resembles our European languages. Many Chinese works, especially those relative to the military profession, being translated into Mantcheou, as the Tartar conquerors adopted the Chinese system of tactics, Amiot availed himself of both texts, and he thus compiled his own treatise in French, *On the Military Art among the Chinese*, which he extracted from antient works written by Chinese generals before our Christian æra, and which are used for the examination of candidates to the rank of officers. This work was published at Paris by Desguignes, in 1772, with some explanatory remarks on certain passages in which Amiot appeared to have misunderstood, or not clearly rendered, the Chinese text. It was afterwards reprinted in the seventh volume of the collection entitled *Mémoires concernant l'Histoire, les Sciences, et les Arts des Chinois, par les Missionnaires*, 15 vols. 4to, published at Paris in 1776—91. A supplement with plates, sent since from China, was inserted in the eighth volume. In the same collection are found most of Amiot's numerous treatises and other works, with a copious index of them in the tenth volume. In the *Lettres sur les caractères Chinois*, addressed to the London Royal Society, he replies to a question referred to him on the subject of certain hieroglyphs observed by Needham on a bust of Isis in the king's cabinet at Turin, and supposed to resemble the antient Chinese symbolic characters. Amiot demonstrated that there was no analogy between the two. This letter is an elaborate dissertation on the Chinese language. He wrote also *L'antiquité de la Chine prouvée par les monumens*, in answer to an essay written by Father Cibot, another Jesuit, under the assumed name of 'Father Ko, a Chinese Jesuit,' both which are inserted in the first and second volumes of the *Mémoires* already mentioned. Cibot had attacked the Chinese chronology of their dynasties, especially with regard to the six emperors who are said to have reigned before Yao. Amiot defended the Chinese historians, as he did likewise in his Life of Koong-tsée, whom we miscall Confucius, which he derived from the best authorities, and in which he gave a genealogy of the philosopher's family, some of whose descendants were living in Amiot's time, and the line of which is there traced back to the Emperor Hoang-ti, about 2600 years before Christ, and three centuries before Yao. It is from this epoch that Amiot reckons the commencement of the historical times of the Chinese, as distinguished from their doubtful and mythological æras. This opinion is conformable to the *Chronological Abridgment of the History of China*, compiled at Pekin in 1770 by order of the Emperor Kien Long, to which work Amiot wrote a prefatory explanation, a copy of which he addressed to M. Bignon, the king's librarian at Paris. Amiot wrote also a dissertation on Chinese music, ancient and modern, which was published separately at Paris, under the care of the Abbé Roussier, and was afterwards inserted in the sixth volume of the *Mémoires*. He also sent over a translation of one of the best Chinese treatises on music, and the MS. was deposited by Bougainville, secretary to the Academy of Inscriptions and Belles Lettres, in the Royal Library at Paris, where it is to be seen. He translated a Chinese poem in praise of the town of Mookden, composed by the Emperor Kien Long, with numerous notes on the country of Mookden, the cradle of the Mantcheou Tartars. Another important work of Father Amiot, is his Mantcheou and French Dictionary, which was the first published in Europe on that language, and was printed at Paris in 1789, in three vols. 4to. The types were cast at the expense of the minister Bertin, who intrusted the revision to the orientalist Langlès. Amiot also wrote a short Mantcheou grammar, which is found in the thirteenth volume of the 'Memoires.' It was thus that Father Amiot continued to send successively from Pekin to Europe the fruits of his assiduous researches in the literature of the country he had adopted, and where he enjoyed universal esteem. He imparted more information on China, and Chinese lore, than any of the missionaries who had preceded him. At the same time, he had the spiritual direction of the congregation of native Christians in the capital. He died at Pekin, in 1794, aged seventy-seven.

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* The capitals of the different Gallic tribes appear in the latter period of the Roman domination to have gone by the name of their tribe in preference to their own original designation; and from hence come most of the modern names of these towns. Thus Mediolanum, capital of the Santones or Santoni, has become Saintes: Cæsaromagus, capital of the Bellovaci, is the present Beauvais, &c. It may be observed that the modern name usually comes from the accusative or ablative form of the antient one

AMIR AL OMARA, or AMIR AL OMRA. [See EMIR AL OMARA.]

AMLWCH, in the island of Anglesey, was formerly an insignificant fishing village consisting of about six houses; but in consequence of the discovery of the celebrated copper mines in the Parys mountain, in the year 1768, it has become a flourishing town: the inhabitants amounted, in 1801, to 4977; and were increased, in 1831, to 6285. It has a capacious harbour cut out of the solid rock or slate, at the expense of the mining companies, capable of admitting thirty vessels of 200 tons burden, where originally there was only a cleft or opening, too small to receive a single vessel. This harbour is dry at low water. It now returns a member to parliament jointly with Beaumaris, Holyhead, and Llangefni.

AMLWCH COPPER MINES. The discovery of these mines was one of the most important events that took place in the mining districts of this country during the last century, for it opened the source of an abundant supply of copper at a time when that metal was beginning to be in great demand for the sheathing of ships and the making of brass. In the year 1762, one Alexander Fraser repaired to the island of Anglesey in search of mines, and examined more particularly the Parys mountain, which in his opinion presented strong indications of minerals in the interior. He communicated his belief to Sir Nicholas Bayley, and prevailed upon him to sink some trial shafts. But no success attended the operations. Sometime afterwards Sir Nicholas, in granting to Messrs. Roe and Co. of Macclesfield a lease of his mines in Carnarvon, imposed upon those gentlemen an obligation to search the Parys mountain for mines. The search was continued for a long time, at considerable expense, but without any favourable result, and was near being abandoned, when, as a last effort, the miners were divided into small parties, and instructed to sink several trial shafts in the neighbourhood of a spring of water which was supposed to be impregnated with copper. On the second day, much to the joy of all concerned, one of these shafts struck upon a large body of copper ore. This discovery was made on the 2d of March, 1768, and the anniversary of that day has ever since been celebrated by the miners. The surface of the mountain had not been penetrated more than seven feet, when the first solid mass of ore was met with. After the discovery of ore, Roe and Co. were dispossessed of their lease by a lawsuit, and the Parys mine was worked by Lord Uxbridge, Mr. Williams, and Mr. Hughes. Mr. Hughes' interest in the Parys mine was a share in the land in right of his wife. It made the fortune of the two latter. The Mona mine, in the same range of mountains, was soon afterwards opened and worked; it was the sole property of Lord Uxbridge, and now belongs to the present Marquis of Anglesea. Both mines proved exceedingly profitable.

As the excavations proceeded, it was found that the ore did not lie in regular veins or lodes, but in large conglomerate masses, which admitted of being quarried in a cheap and easy manner by means of workings exposed to the day. The ore was mixed with, and imbedded in slate, and descended to various depths, from twenty to fifty fathoms, so that in time the workings assumed the shape of a large deep basin, the sides of which were more or less perpendicular, and the bottom full of deep pits and irregularities. When the mines were in full work, every corner of this immense excavation resounded with the blows of the miners and the thunders occasioned by the constant blastings with gunpowder.

At one time the mines gave employment to 1500 workmen, ninety of whom were employed in the smelting-houses. Some estimate may be formed as to the quantity of ore raised, from the circumstance of there having been at one time a stock of 30,000 tons at the Mona mine, and 14,000 tons at the Parys mine. The principal part of the ore was a sulphuret of copper, intermixed, however, with black copper, blue and green carbonate, and some strings of pure native copper. The richer ores were exported to Swansea, or sent to the smelting works at Stanley, near Liverpool; but those of a poorer kind, containing from 1 to 2½ per cent. were broken into small pieces, and placed in ovens or kilns for the purpose of having the sulphur extracted from them. When the oven or kiln was full, hot coals were applied to various parts of the ore, which soon ignited, and the fire smouldering slowly, disengaged the sulphur, which fell into a chamber, connected by means of flues with the kiln or oven. This process of sublimation lasted from six to ten months, according to the quantity of ore operated upon. When the sulphur was supposed to be thoroughly extracted, the ore was taken from the ovens to the company's smelting houses at Amlwch, and there run into rough copper, technically called metal. One of the smelting-houses contained upwards of thirty reverberatory furnaces; each furnace was charged with twelve cwt. of the roasted ore, which smelted in five hours, and yielded half a cwt. of rough copper or metal, containing about 40 per cent. of pure copper. The sulphur collected in the chamber, as above described, was from time to time taken out, fused, and cast into rolls and cones for the London market.

In excavations so extensive, and occasionally penetrating to the depth of fifty fathoms, there could not fail to accumulate a large body of water. The water was found to hold in solution a portion of sulphate of copper, which was separated in the following manner: large ranges of rectangular pits, thirty-two feet in length, twelve feet in width, and two feet in depth, were constructed; the pits were filled with rows of cast-iron plates, placed on edge, and prevented from touching each other by a projecting snag upon the upper side. In course of time, however, any kind of refuse cast or malleable iron was substituted for the plates, and found to answer quite as well at less than half the expense. The water impregnated with sulphate of copper was pumped up from the excavations, and made to flow along troughs or channels into the pits. A slow but continued action took place upon the surface of the iron which was graduallv dissolved and carried off, leaving nearly an equal quantity of oxide of copper precipitated in its place. The precipitation of copper on so large a scale, at a time when the subject was little understood, gave rise to a vulgar opinion, that the iron was converted into copper. Once in two or three months the stream of water was diverted for a short time, the surface of the iron scraped, and the precipitate removed from the pits to be smelted. Being unavoidably mixed with a considerable portion of iron and earthy matter, the precipitate did not yield more than 50 per cent. of copper, instead of 87 per cent. which the pure oxide contains, but the copper obtained from it was always considered of the best quality. The water, charged with sulphate of iron, after leaving the pits, was received into large shallow pools, where a precipitation of the iron took place, and this being collected and dried, was sold as yellow ochre.

For the last ten or fifteen years these celebrated mines have been on the decline; the great mass of ore is exhausted; and the present limited operations are guided by partial and uncertain indications in the slate or matrix. Not more than one-third of the people are now employed, and the mining prosperity of Amlwch, which once seemed to spring from an inexhaustible source, has almost passed away.

During the most flourishing period it was computed that from 60,000 to 80,000 tons of ore were annually extracted from the Parys and Mona mines. Supposing the ore to have averaged 5 per cent. (which is 3¼ per cent. less than the average of the Cornish ores,) the above quantity must have yielded upwards of 3000 tons of copper—a product more than equal to that of the whole of the Cornish mines at the same period. At the time now referred to, the exports of Amlwch consisted of—

The richer sorts of copper ore;
The poorer ditto, ditto, roasted;
Rough copper or metal;
Dried precipitate of copper from the pits;
Refined sulphur;
Ochre;
Alum;
Green vitriol or sulphate of iron.

The produce of the mines, for the last five years, has been from 700 to 800 tons of copper annually, or about one-eighteenth part of the copper produced in the United Kingdom.

The ores mined at present do not yield above four per cent. of metal.

A sulphate of lead was found in considerable quantities mixed with the soil or earth which immediately reposed upon the copper ore. The lead obtained from this sulphate contained from fifty to sixty ounces of silver in each ton, and a great quantity of the sulphate was dug, in the expectation that it would be profitable to smelt it, and afterwards extract the silver. This expectation, however, though apparently well grounded, was never realized; for in separating the sulphate of lead from the soil, and also in the process of smelting, difficulties occurred, which it was found impossible to overcome in practice.

It is exceedingly probable that the Parys mountain, or its immediate neighbourhood, was formerly the scene, if not of successful enterprize in mining and smelting, at least of trial and experiment. Long before the present mines were discovered, a collection of waters upon the summit of the mountain was known by the name of the Mine Pool; and a hearth for smelting lead, some pieces of lead and charcoal, and a plate of copper weighing about 50lbs., all found anterior to the opening of the modern mines, seem to attest that the minerals in the vicinity of Amlwch attracted the notice of a generation remote from our own.

AMMIA'NUS MARCELLI'NUS, a soldier and author who lived in the fourth century, and wrote a history of the emperors from the accession of Nerva, A.D. 96, to the death of Valens in 378; the last profane history written by a Roman subject in the Latin language. He was of Greek family, and born at Antioch; at least Libanius claims him as a fellow-citizen. At an early age he entered the army, in the distinguished service of the household guards of Constantius, son of Constantine. He was peculiarly attached to the fortunes of Ursicinus, the master of the horse, under whom he served, first in the East in 350, afterwards in Gaul, whither he went in 355. He was again sent with Ursicinus into the East, and served under the Emperor Julian in his Persian war, which he related at length and with considerable power. Later in life he retired to Rome, where he wrote his history, in thirty-one books. Of these, the first thirteen are lost, the least valuable part, since they can but have contained an epitome of the history of two centuries and a half. The fourteenth book begins just before the death of Constantius, and the transactions of the reign of Julian extend nearly to the end of the twenty-fifth. The question whether he was a Christian or a pagan has been agitated. Though he has not expressly stated his sentiments, it seems evident to us that at least he was not a Christian. In style he is inflated and vicious; but passages of considerable effect and eloquence occur in his work, which has every appearance of being a faithful and unprejudiced narration of public transactions, in many of which he had been personally engaged. "It is not without sincere regret," says Gibbon, "that I must now take leave of an accurate and faithful guide, who has composed the history of his own times, without indulging the prejudices and passions which usually affect the mind of a contemporary." Chap. xxvi. Some suppose the Greek life of Thucydides to be written by him. The early editions of Ammianus are numerous. The most valuable is that of Gronovius, folio, Lugd. Bat., 1693; which contains the life and prefatory matter of the Valesii. This has been the base of two other editions, with the notes of later commentators, both published at Leipzig, (Lips.) one by Ernesti in 1773, one by Erfurdt in 1808. There is an old English translation by Philemon Holland, (Lond. 1609,) and a French one by Moulines, (Berlin, 1775, Lyons, 1778.)

AMMON, or AMUN, or AMN RA, the name of an Egyptian deity, whom the Greeks considered as synonymous with their Zeus (Jupiter). He is often represented on the monuments of Egypt and in other works of Egyptian art with a ram's head and a human body; about which Herodotus (ii., 42) tells the following odd story, picked up during his travels in Egypt:—'Hercules was exceedingly anxious to have a sight of Zeus, but Zeus did not feel inclined to show himself. At last, when Hercules was very importunate, Zeus hit on the following contrivance: he flayed a ram, and cutting off the head put it before his face; he then got into the skin, and in this guise showed himself to Hercules. From this circumstance the Egyptians represent the image of Zeus with a ram's head.' But the ram's head is not the peculiar property of Ammon: it is found also, for instance, on the head of Cneph, with the appropriate distinguishing symbols. We consider the community of symbols in the representations of different deities, as indicating the origin of the political union of the several tribes or peóples to whom the several deities belonged.

The worship of Ammon was not, like that of Osiris and Isis, common to all the Egyptians: it seems to have been specially of Ethiopian origin. The two chief Ammonian temples which now exist are that at Carnak, on the east side of the Nile, forming part of the extensive ruins of Thebes, and that of Siwah, in the Libyan desert, known to the Greeks by the name of Ammonium.

The god Ammon appears also under the figure of a criosphinx or ram-sphinx, which is an animal with a ram's head and the body of a beast of prey of the feline species. (See *British Museum:—Egyptian Antiquities*, vol. i., and the drawings in the French work on *Egypt. Antiquités*, tom. iii., pl. 32.)

The word Ammon cannot, we think, be satisfactorily explained from the Coptic language, as it now exists. The various guesses and conjectures may be seen in Jablonski's *Pantheon*, vol. i.; out of all the guesses, that which connects the word *Ammon*, or *Amun*, with the Coptic word signifying 'to feed' sheep, is the most probable. (See *Coptic Testament*, John xxi. 15; &c.) Ammon then would be the god of a Nomadic race, and originally a pastoral deity.

We find the *city* or *portion* of Ammon mentioned in Jeremiah xlvi. 25; Ezekiel xxx. 15., under the name of Amon-No; and in Nahum iii. 8., under the name of No-Amon. This city is generally supposed to be the Greek Diospolis, or 'city of Jupiter,' now forming part of the ruins of Thebes. But the No of Nahum is more probably the Diospolis of the Delta.

The name Amon forms a part of the proper name of several Egyptian kings and persons, such as Amenotph (see MEMNON), and Ptamon; and is also often used in the title or qualifying term applied to the name of a king: thus we find on the monuments prefixed to the name of Ramses, the title *Amn-mai*, 'beloved by Ammon.' This may be compared with such Greek proper names as *Diphilus*, 'dear to Jupiter,' and such German names as *Gottlieb*, (Theophilus) 'dear to God,' *Gottfried* (Godfrey) 'peace of God.'

AMMO'NIA, the modern name of the *volatile alkali* formerly so called to distinguish it from the more fixed alkalis: it is a gaseous body, and was first procured in that state by Priestley, who termed it alkaline air. (*Experiments on Air*, vol. ii. p. 370.) He obtained it from sal ammoniac, and hence the present name of the alkali.

Ammonia, like all the other alkalis, is a compound substance; it consists of azote and hydrogen, in proportions hereafter to be mentioned; it exists, combined with various acids, in urine and in some calculi. M. Boussingault (*An. de Chim. et de Phys.*, xliii., p. 334.) found it in a native oxide of iron, and Dr. Marcet (*Phil. Trans.* 1823) detected it in sea water combined with muriatic acid. Ammonia cannot be formed by direct action after its elements have both assumed the gaseous form; it is requisite that one of them should be in the nascent state: it is generated during certain natural processes, and is obtained by several artificial ones; these will be noticed after a description of the method of preparation first employed by Dr. Priestley, and still adopted by chemists, has been given.

Sal ammoniac, a salt already mentioned, is a compound of muriatic acid and ammonia; when it is powdered and mixed with three-fourths of its weight of powdered lime, and heated in a retort, ammoniacal gas is plentifully given out, which must be received in jars filled with and inverted in mercury. The changes which occur during the production of the ammonia are of a complicated nature. Sal ammoniac, or muriate of ammonia, consists of muriatic acid and ammonia, and the acid itself is constituted of chlorine and hydrogen; lime is composed of the metal calcium and oxygen. When the muriate of ammonia and lime act upon each other, the chlorine of the muriatic acid combines with the calcium of the lime, and the resulting chloride of calcium remains in the retort, while the hydrogen of the acid combines with the oxygen of the lime to form water, which evaporates with the ammonia evolved.

The ammonia thus obtained is aëriform; and as it does not become fluid under common circumstances of temperature and pressure, nor solid in any case, is termed a *gas*—*ammoniacal gas*. Its properties are, that it is colourless, transparent, and of course invisible; possessing the elasticity and mechanical properties of atmospheric air. The smell is peculiar and extremely pungent, and its taste is highly acrid. An animal put into it is immediately killed, and a taper when immersed in it is extinguished: it appears, however, to be slightly inflammable, for the flame is rather enlarged before it goes out; and a small jet of the gas may be burned in oxygen gas. The density of ammoniacal gas is to that of atmospheric air, nearly as 0·5902 to 1; 100 cubic inches weigh rather more than 18 grains. It acts strongly as an alkali, turning vegetable blues green, and yellows reddish brown, and saturates acids forming various salts.

Mr. Faraday (*Phil. Trans.* 1823, p. 189) found, that by subjecting ammoniacal gas to a pressure of about 6½ atmospheres, at the temperature of 50°, it became a colourless transparent fluid, the density of which was 0·760, water being 1.

Water dissolves ammoniacal gas with great rapidity, and in large quantity; a few drops of water thrown up into a jar of the gas instantly condense it; a piece of ice also immediately liquefies in and condenses the gas. Water at 50° is capable of condensing 670 times its volume; the density of the solution diminishes as its strength increases, so that, according to Davy, with whom other chemists nearly agree, when water contains 9½ per cent. of ammonia, its density is 0·9692; but when it holds 32½ per cent., it is reduced to 0·8750. The aqueous solution is colourless, transparent, and has the pungency and alkaline property of the gas: by exposure to the air, the ammonia escapes, and by the application of heat it is expelled from the water; on account of this volatility of ammonia, vegetable colours which have been altered by it regain their original tints as it evaporates, which is not the case when the change has been caused by the fixed alkalis.

The presence of ammonia may be detected by its strong smell, by holding moistened turmeric paper where it is suspected to exist, and by the formation of a white vapour, when exposed to a glass rod moistened with muriatic acid.

Dr. Priestley found that the strong light of a lens produced no effect upon ammoniacal gas. By moderate degrees of heat it is merely expanded; but when passed through an ignited porcelain tube, as was first shown by Dr. Priestley, it is decomposed, and, increasing to nearly double its volume, rendered inflammable. (*Experiments on Air*, vol. ii., p. 393.) He also first proved that it is decomposed by the electric spark, and separated into hydrogen and azotic gases, (vol. iii., p. 389.) These experiments have been repeated by Berthollet, Davy, and Gay-Lussac. Dr. Henry (*Annals of Philosophy*, N. S., viii., p. 347) also found that when ammoniacal gas is electrified, its volume is exactly doubled, and it is resolved into three volumes of hydrogen gas, and one volume of azotic gas. As the result of these experiments, it is now generally admitted, that ammoniacal gas is a compound of three volumes of hydrogen gas and one volume of azotic gas, condensed into two volumes: by weight it is composed of

Three atoms of hydrogen 1 × 3	= 3	or	hydrogen	17·64
One atom of azote . .	= 14		azote .	82·36
Weight of its atom .	= 17			100·

That this is the composition of the gas in question is also shown by comparing its calculated and actual density. According to Dr. Thomson (*Chemistry of Inorganic Bodies*, vol. i., p. 704) 300 cubic inches of hydrogen gas weigh 6·4842 grains, and 100 cubic inches of azotic gas weigh 30·2794 grains, making together 36·7636; but during combination the gases condense to half their volume, consequently 200 cubic inches of ammoniacal gas weigh theoretically 36·7636 grains, and 100 weigh 18·3818. Now according to Allen and Pepys the weight by actual experiment is 18·18 grains, which is sufficiently near the calculated statement to prove its correctness.

Ammonia is used for many purposes both in medicine and in scientific chemistry; as however it would be impossible in some cases, and inconvenient in almost every one, to employ it in its gaseous state, it is used in solution in water, and then frequently called *liquid ammonia*: but this term can be applied with propriety only to the gas rendered fluid by cold and pressure. Solution of ammonia may be readily prepared by mixing muriate of ammonia with lime, in the mode and proportions already mentioned, and passing the gas liberated into water: this may be done either by inserting a glass tube bent at right angles into the mouth of the retort, and then putting the other end into a bottle of water; or, which is better, in case absorption should take place, a tubulated receiver may be used instead of the bent tube, securing it properly by a perforated cork to the retort, and luting it so that it may withstand the pressure of passing the gas into the water.

Having now stated the direct method of preparing ammoniacal gas, its properties, composition, and aqueous solution, it will be proper to notice the different processes, both natural and artificial, by which it is produced in large quantity. The first of these is the putrefaction of animal matter, We have already mentioned that hydrogen and azote are the elements of ammonia, and, with some exceptions, there is this difference between animal and vegetable matter, that the first contains azote, while the latter does not. When then, animal matter is subjected to decomposition, whether the operation be the natural one of putrefaction, or the artificial one of the application of heat, ammonia is one of the results obtained by the new arrangement of its elements, and it is combined with carbonic acid, forming carbonate of ammonia. It will be readily understood how this happens: the animal matter consisting of hydrogen, azote, oxygen, and carbon, the first two gases unite to form ammonia, and the two latter elements to constitute carbonic acid; it is extremely probable, also, that during putrefaction the oxygen of the atmosphere may assist in the formation of this acid.

Ammonia may be artificially produced from most animal matter, except fat, by subjecting it to heat in iron cylinders; and when bones, hoofs, or horns, are thus decomposed, a large quantity of carbonate of ammonia is obtained, some of which is in a solid form, but the greater portion is dissolved in water and mixed with empyreumatic oil. This liquor has a dark colour, and a pungent, disagreeable smell: when it is purified so as to separate the greater part of the oil, it is the *spirit of hartshorn* of the shops. The hard portion of bone, being mostly phosphate of lime, does not yield any ammonia, but there is intermixed with it a large quantity of a substance termed chemically *gelatine*, which is similar to isinglass, and that this yields ammonia is readily shown by heating it in a retort with a spirit lamp; the product received in a vessel containing turmeric paper soon renders its yellow colour reddish-brown; and there are also produced water, carbonic acid, and empyreumatic oil.

Vegetable matter, when azote is one of its elements, as the gluten of wheat, yields ammonia if heated: coal soot also contains it; but the decomposition of coal, effected during the production of carburetted hydrogen for the purpose of gas illumination, is now an abundant source of ammonia, which, by various processes, is converted into sulphate, muriate, or carbonate.

It has been already observed, that although hydrogen and azote constitute ammonia, yet when they have both assumed the gaseous state they cannot be made to unite. Dr. Austen (*Phil. Trans.*, vol. lxxviii. p. 380) attempted to combine them by electricity, cold, and other methods, but he did not succeed; he found, however, that when iron filings moistened with water were exposed either to azotic gas or atmospheric air, the nascent hydrogen of the decomposed water united with the azotic gas and formed the alkali in question, and it occurred most readily in the pure azotic gas.

Ammonia may also be produced by the action of both elements in their nascent state; if tin filings be put into nitric acid diluted with water, rapid action ensues, with the evolution of much nitric oxide gas, and the formation of peroxide of tin. In this process, a portion both of the nitric acid and water is decomposed, azote from the former, and hydrogen from the latter, both in their nascent state, combine, and the resulting ammonia forming nitrate with the undecomposed nitric acid, this salt is diffused through the peroxide of tin; add lime to this mixture, and owing to its greater affinity for nitric acid than of ammonia for it, nitrate of lime is produced and ammoniacal gas evolved, as may be ascertained by the smell and its action upon turmeric paper. Iron and phosphorus decompose diluted nitric acid with similar results; and it has also been found, that the rust or peroxide of iron formed within houses is capable of absorbing and strongly retaining the ammoniacal vapours there developed. (*Ann. de Chim. et de Phys.* 24—99.)

In the *Quarterly Journal of Science*, &c. (vol. xix. p. 116.) Mr. Faraday has detailed some very curious cases of the production of ammonia, in which the substances yielding it are, according to the present state of chemical science, destitute of the azote supposed to be necessary to its formation. From among numerous experiments, the following may be selected as one of the most striking:—a glass tube was filled with hydrogen gas, a piece of zinc foil dropped into it, and upon that a portion of hydrate of potash, and a slip of moistened turmeric paper was then introduced. The potash was melted by a spirit-lamp and suffered to run upon the zinc, and by continuing the heat, the turmeric paper was reddened owing to the evolution of ammonia. Now the elements included in this operation were oxygen, hydrogen, zinc, and potassium; the source, therefore, of the ammonia is by no means evident, and it is difficult of explanation.

The hydrates of soda, lime, and barytes produce similar effects; and much ammonia may be evolved by their action upon iron, tin, zinc, lead, and arsenic. But spongy platina, silver, and gold do not produce any; the metals, therefore, seem to act according to their power of absorbing oxygen; and water or its elements appear to be necessary to the experiment.

We shall now briefly notice the nature and results of the action of ammonia upon certain elementary bodies. It has been already stated that ammoniacal gas may be burned in oxygen gas; a mixture of these gases may also be fired by the electric spark, the results being water and azotic gas; a little nitric acid is also generated, if the quantity of oxygen gas be sufficient to combine with all the hydrogen of the ammonia. (Dr. Henry, *Phil. Trans.*, 1809.) Chlorine gas, by mere admixture with ammonia, decomposes it partially, and the action is attended with the evolution of light and heat: the chlorine combines with a portion of the hydrogen of the ammonia; muriatic acid is thus formed, which uniting with the ammonia remaining undecomposed, the result is muriate of ammonia, while azotic gas is liberated. The same effects are obtained, if the aqueous solutions of the gases in question be employed; but then the changes are unaccompanied by light or heat.

Ammonia has no action upon carbon, except at a high temperature; if, however, a piece of well-dried charcoal be passed up into ammoniacal gas over mercury, it is capable of absorbing ninety times its volume in twenty-four hours. The gas undergoes no chemical change, and from Saussure's experiments, it appears that the absorption is analogous to the capillary attraction of liquids by very small tubes. Sulphur, when strongly heated in ammoniacal gas, partially decomposes it, and hydrosulphuret of ammonia is one of the products. At a high temperature, phosphorus also decomposes ammonia and phosphuretted hydrogen is formed; when no heat is employed, phosphorus absorbs the gas, and a deep-brown coloured substance is formed which is almost pulverulent: its properties have not been examined. Iodine and ammonia, provided both be perfectly dry, combine without the agency of heat, and form iodide of ammonia. (Colin, *Ann. de Chim.* xci. p. 262.) The compound is formed immediately on mixture: it is a shining viscid liquid, of a brownish-black colour, but as the absorption of ammonia goes on, it loses its lustre and viscidity. It is not fulminating, but, if put in contact with water, the ammonia is decomposed, and a black powder formed, which is the well-known detonating substance *iodide of azote*, generally prepared by putting iodine into the aqueous solution of ammonia.

The action of the metals upon ammonia varies considerably according to their nature. Gay-Lussac and Thénard have shown that potassium and sodium absorb ammoniacal gas, and are covered with a white crust. The absorption is more rapid when the heat of a spirit-lamp is employed; the white crust becomes deep yellow, the surface of the metal is brilliant and smooth, whilst the new compound is greenish, fuses, and runs upon the sides of the tube; when the operation is continued until the potassium entirely disappears, ammoniacal gas is not only absorbed, but a portion is decomposed and hydrogen gas given out. The compound formed is of a deep olive-green colour, its fracture crystalline, and its density greater than that of water. It fuses at a temperature higher than boiling water, does not conduct electricity, burns in oxygen gas, and yields hydrate of potash and azotic gas. Water decomposes it rapidly; the results are potash and ammoniacal gas. Gay-Lussac and Thénard consider it as a compound of azoturet of potassium with ammonia.

When ammoniacal gas is passed over ignited iron or copper, the density of the metals is much diminished; and by the repeated action and decomposition of the gas, iron may be increased in weight, as proved by Despretz, 11·5 per cent., which increase is owing to the absorption of azote by the metal. It has been mentioned under the head of amalgams, that mercury and ammonia, when subjected to the action of voltaic electricity, form a compound which has been termed an amalgam. This experiment was first made by Berzelius and Pontin, and may be thus performed:—put some mercury into an open glass capsule, and place in it a platina wire connected with the negative pole of the battery; pour on the mercury a strong aqueous solution of ammonia, and connect this by a platina wire, at the distance of a line from the mercury, with the positive pole of the battery. When the battery is rendered active, the positive extremity first gives out gas, but soon after it is disengaged also from the mercury, which expands, becomes gradually as thick as butter, is of a silvery-white colour, and eventually increases to five or six times its original volume.

At a temperature of 70° to 80° of Fahrenheit, the amalgam is a soft solid; at 32°, it is a firm crystalline mass. Its density is about 3, water being 1. If exposed to the air it soon becomes covered with a white crust of carbonate of ammonia; and when thrown into water, the mercury returns to its original state, a weak solution of ammonia is formed, and hydrogen gas is evolved equal to half the volume of the amalgam used in the experiment.

Davy improved this process by putting about 50 grains of mercury into a cavity made in a piece of moistened sal-ammoniac, placed on a platina plate attached to the positive pole of the battery, while the mercury was connected by a platina wire with the negative one. This process is not only more easily executed than the foregoing, but the amalgam obtained by it is more permanent.

Great difference of opinion prevails as to the nature of this amalgam. Gay-Lussac and Thénard consider it as a mere combination of mercury and ammonia, while Berzelius regards it as a real amalgam of mercury and *ammonium*, which he considers as a metal, composed of one volume of azotic gas, and four volumes of hydrogen gas; this opinion is, however, entirely hypothetical, and is shown by numerous facts and analogies to be extremely improbable.

Although mercury is the only metal which appears to combine with ammonia, there are several metallic oxides which unite with it. These compounds are called *ammoniurets*, and will be described under each metal: for the present we shall merely mention, that the solution of ammoniuret of zinc is colourless; that of peroxide of copper is purple, and of nickel the same, except when the excess of ammonia is driven off, and then it is green; the ammoniuret of cobalt is of a fine red colour. The solid ammoniurets of silver and gold are extremely explosive substances, and are called fulminating gold and silver. With the various acids, ammonia forms salts· we shall, however, describe only the more important, viz., the acetate, carbonates, muriate, nitrate, oxalate, and sulphate.

Acetate of Ammonia.—This salt is prepared by adding sesquicarbonate of ammonia to dilute acetic acid. Owing to the superior affinity of the acetic acid for the ammonia, the carbonic acid is expelled from it with effervescence, and a colourless solution remains, which, when concentrated, and placed under the exhausted receiver of an air-pump, over sulphuric acid, yields transparent prismatic crystals, the taste of which is hot; they are very deliquescent. According to Dr. Thomson, they are composed of 1 atom of acetic acid, 51; 1 atom of ammonia, 17; and 7 atoms of water, 63; their atomic weight is, therefore, 131.

Acetate of ammonia is directed to be prepared in the *London Pharmacopœia*, and kept in solution under the name of *Liquor Ammoniæ Acetatis*. It is used externally as a refrigerant, and internally as a diaphoretic, and is commonly known by the name of *Spirit of Mindererus*.

Carbonates of Ammonia.—Of these there are three, the *carbonate*, *sesquicarbonate*, and *bicarbonate*. The carbonate may be procured by mixing one volume of carbonic acid gas and two volumes of ammoniacal gas in a jar over mercury; they immediately condense into a white solid, which is carbonate of ammonia. It may be also prepared by mixing and heating carbonate of potash and muriate of ammonia. By a series of decompositions, the carbonic acid is transferred from the potash to the ammonia of the muriate, and the carbonate formed, being volatile, rises in vapour, and is condensed in the upper part of the subliming vessel. It is a white salt, pungent to the smell, and acrid to the taste; soluble in cold water, and decomposed by hot water. It acts as an alkali upon vegetable colours, and consists of

One atom of carbonic acid	22
One atom of ammonia .	17
Atomic weight . . .	39

It is used in medicine as a stimulant in a preparation called in the *Pharmacopœia*, *Spiritus Ammoniæ Aromaticus*, and commonly *Spirit of Sal Volatile*.

Sesquicarbonate of Ammonia.—This salt is contained in the *Pharmacopœia* under the incorrect name of *Ammoniæ Subcarbonas*, or *subcarbonate of ammonia*. It is directed to be prepared by heating, in a subliming vessel, a mixture of one part of muriate of ammonia, or sal ammoniac, and one part and a half of carbonate of lime or chalk; it is, however, usually, and more economically obtained by decomposing sulphate of ammonia with carbonate of lime. In this case, double decomposition ensues, sesquicarbonate of ammonia is formed, volatilised, and is condensed in the upper part of the vessel, while sulphate of lime remains in the lower.

Sesquicarbonate of ammonia is a colourless, translucent, moderately hard salt; it has a pungent smell, and a sharp, penetrating taste, but less so than the carbonate. It is soluble in about four times its weight of cold water, and is decomposed by hot water. It acts upon vegetable blues and yellows, like an alkali, and on this account, as well as its ammoniacal smell, has been called a subcarbonate.

It is composed of

Three atoms of carbonic acid	66
Two atoms of ammonia . .	34
Two atoms of water . . .	18
Atomic weight . . .	118

As three atoms of carbonic acid are combined with one atom of ammonia, and these being as one and a half to one, this salt, like others similarly constituted, is generally termed a *sesquicarbonate*.

It is used in medicine as a stimulant, and usually called *smelling salts*. It is also employed as a substitute for yeast in making some of the finer kinds of bread. As a chemical re-agent, it is extensively used; and also for preparing various other ammoniacal salts.

Bicarbonate of Ammonia.—This salt may be prepared by mixing, over mercury, equal volumes of carbonic acid and ammoniacal gases, and adding a little water; by passing carbonic acid gas into a solution of sesquicarbonate of ammonia, in which way it may be obtained in crystals; by heating a mixture of equal weights of muriate of ammonia and carbonate of lime in a subliming vessel; or lastly, and with the greatest facility, by exposing powdered sesquicarbonate of ammonia to the air until it becomes inodorous; in this case, a larger proportion of ammonia escapes than remains, and the residue thus becomes a bicarbonate. When obtained by sublimation, it resembles the sesquicarbonate in appearance, but differs from it in being devoid of pungency; it is rather hard, soluble in cold, and decomposed by hot water. When perfect, it has no alkaline action on vegetable colours, like the preceding carbonates. The salt obtained by sublimation, or by exposing the sesquicarbonate to the air, consists of

Two atoms of carbonic acid	54
One atom of ammonia .	17
Two atoms of water . .	18
Atomic weight . . .	89

It is rarely used either in medicine, or as a chemical re-agent.

Muriate of Ammonia.—This salt has been long known, and extensively used, under the name of *Sal Ammoniac*. The substance from which it was first procured, was the soot of camel's dung. It is now largely manufactured in Europe, by combining muriatic acid, either directly or indirectly, with ammonia, obtained from the decomposition of animal matter, but principally from the liquor obtained during the preparation of coal-gas, or carburetted hydrogen. The impure carbonate of ammonia which this liquor contains is either at once saturated with muriatic acid, or first converted into sulphate of ammonia, and afterwards, by decomposing it with common salt, into muriate: the products are sulphate of soda and muriate of ammonia, and this last is separated by crystallization, and sublimed.

Muriate of ammonia, as obtained by sublimation, is an amorphous, translucent, colourless salt; but when separated from water by crystallization, its form is cubic. It has a sharp, saline taste, but no smell, and dissolves readily in water; exposure to a dry air produces no change in it; by heat, it volatilizes without decomposition. Lime and the fixed alkalis decompose it, evolving ammoniacal gas; and sulphuric acid expels the muriatic acid gas. It is composed of equal volumes of muriatic acid gas and ammoniacal gas, as may be shown by the perfect condensation of these proportions in a jar over mercury; or by weight, of

One atom of muriatic acid	37
One atom of ammonia .	17
Atomic weight . . .	54

This salt is much employed in various chemical manufactures. It is generally used for preparing ammoniacal gas, and the sesquicarbonate of ammonia, in the modes already described.

Nitrate of Ammonia.—When sesquicarbonate of ammonia is added to dilute nitric acid, effervescence occurs, owing to the evolution of the carbonic acid of the decomposed ammoniacal salt, and a solution of nitrate of ammonia remains; this, by evaporation, yields slender crystals of nitrate of ammonia; they are colourless, inodorous, very sharply saline to the taste, readily soluble in water, and deliquescent in a moist atmosphere. When heated to about 500° of Fahrenheit, nitrate of ammonia decomposes, and is resolved into water and nitrous oxide gas. Sometimes the solution of nitrate of ammonia, instead of being merely evaporated till crystals are formed, is reduced till the water is so nearly expelled, that the salt solidifies in cooling. In both states it is composed of

One atom of nitric acid	54
One atom of ammonia	17
One atom of water .	9
Atomic weight . .	80

It is principally used for preparing nitrous oxide gas.

Oxalate of Ammonia.—This salt is prepared by adding sesquicarbonate of ammonia to a solution of oxalic acid, until it is saturated. The solution by evaporation yields small prismatic crystals; these are devoid of smell, have a bitter, saline taste, and dissolve readily in water.

Oxalate of ammonia is composed of

One atom of oxalic acid	36
One atom of ammonia	17
Two atoms of water .	18
Atomic weight . . .	71

It is used as a test of the presence of lime, and to precipitate it from solution in chemical analyses.

Sulphate of Ammonia.—It has been already mentioned, that this salt is formed as an intermediate step in preparing muriate of ammonia, and this is the principal purpose to which it is applied. In small quantity, it is best made by saturating dilute sulphuric acid with sesquicarbonate of ammonia. The solution is colourless, and by evaporation yields small prismatic crystals; these have a saline taste, and are readily dissolved by water. Crystallized sulphate of ammonia is composed of

One atom of sulphuric acid	40
One atom of ammonia .	17
Two atoms of water . .	18
Atomic weight	75

According to Dr. Thomson there is a variety of this salt, the crystals of which contain only half as much water as the abovementioned; but this kind is not usually met with.

The general properties of the salts of ammonia are as follows: soluble in water, with few exceptions; decomposed by the fixed alkalis, and alkaline earths, with the evolution of ammonia; decomposed when a magnesian salt and a soluble phosphate are added to them, a crystalline precipitate being formed, which is a double salt, composed of phosphate of ammonia and phosphate of magnesia; decomposed and dissipated by heat, except the acid, like the phosphoric and boracic, be a fixed one, in which case the ammonia is expelled, and the acid remains: a solution of muriate of platina occasions a yellow precipitate in solutions of ammoniacal salts.

AMMONIAC (GUM), a concrete juice produced in Persia, Abyssinia, &c., but the plant from which it is obtained does not appear to have been ascertained. Willdenow refers it to the *Heracleum gummiferum*, in which he is followed by the British Colleges of Physicians. Others refer it to the *Ferula orientalis*. It consists of grains of various sizes, usually called *tears:* they are either separate or agglutinated into masses; their colour is whitish, but they become yellow by the action of the air; they are shining, opaque, irregular in shape, and more or less globular; when cold, ammoniac is rather hard and brittle, it softens by the heat of the hand, but does not entirely liquefy at a stronger heat. The smell is peculiar and disagreeable, and the taste is nauseous, at first mucilaginous and bitter, and afterwards acrid. Its specific gravity is 1·207. When triturated with water, it is partly dissolved, forming an emulsion which becomes clearer on standing. When distilled with water, it loses its volatile oil, and becomes inodorous; the distilled water has the odour of the gum, and small drops of limpid, colourless oil float on its surface. Alcohol takes up about half its weight, forming a brownish-yellow solution; which becomes turbid when mixed with water. It is combustible, burning with a white flame, little smoke, and a strong smell; the ashes left, consist of small portions of the carbonates of potash and lime, and phosphate of lime.

Sulphuric acid readily dissolves ammoniac, and water precipitates the solution; nitric acid converts it into a bitter substance; the fixed alkalies form with it a turbid solution, which is extremely bitter.

According to Bucholz, ammoniac consists of

Resin	72·0
Gum	22·4
Bassorine	1·6
Volatile oil, water and loss	4·0
	100

It is used in medicine as a stimulant and expectorant.

AMMONITES, a nation descended, according to Gen. xix. 38, from the incestuous connexion of Lot with his younger daughter, about the year 1898 B.C. The name of their progenitor, בֶּן־עַמִּי *Ben Ammi*, means *son of my kindred*, and the name *Ammon* has nearly the same signification. There is no etymological connexion between בְּנֵי עַמּוֹן children of ʿammon, and the Egyptian word Ammon or Amon. The Ammonites, or the children of Ammon, are called by the Septuagint and Josephus, Ammanitæ. The country which they inhabited was situated between the rivers Arnon and Jabbok, N.N.E. of the Moabites, and east of the tribes of Reuben and Gad. Giants dwelt there, we are told, in old time; and the Ammonites called them Zamzummim (זַמְזֻמִּים those who devise wickedness), a people great and many, and tall as the Anakim; but the Lord destroyed the Zamzummim before the Ammonites, who dwelt in their land. The Israelites, under Moses, smote the Amorites, and possessed their land from Arnon unto Jabbok, even unto the children of Ammon, about the year 1452 before Christ: but they did not enter the territory of the Ammonites, for the border of the children of Ammon was strong (Num. xxi. 24). The Israelites were directed not to distress the children of Ammon, because the Lord had given the land unto the children of Lot for a possession. About 1161 B.C., the children of Ammon, under their king, passed over the Jordan, and encamped in Gilead with the pretext of recovering the country which they falsely accused the Israelites of having taken from them 300 years before. Jephthah, who then commanded the Israelites, reminded the king of the Ammonites, that the Israelites never went into the borders of Ammon. In the battle that followed, Jephthah smote the Ammonites from Aroer to Minnith, and subdued them. (Judges x. xi.) In the year 1095 B.C. Nahash, king of the Ammonites, encamped against Jabesh Gilead, and offered to make terms with the inhabitants on condition that he might put out all their right eyes, and lay it for a reproach upon Israel. Upon this, messengers from Jabesh went to Gibeah of Saul; and Saul put the people in three companies; and they came into the midst of the host in the morning watch, and slew the Ammonites until the heat of the day, so that two of them were not left together. After the victory, Samuel said, Let us go to Gilgal and renew the kingdom, and there they made Saul king. (1 Sam. xi.) Nahash afterwards showed kindness unto David: he died about B.C. 1037. When David sent to comfort his son Hanun, the princes of the children of Ammon suspected that he had some design, and the king took David's servants, and treated them shamefully. The Ammonites then hired the Syrians of Beth-Rehob, and 20,000 footmen of Zoba, and of king Maacoh 1000 men, and of Ishtob 12,000. To oppose this force, David sent out Joab, who defeated the Ammonites. Upon this, Hadarezer, the Syrian king, sent and brought out the Syrians from beyond the Euphrates, but David took 700 chariots of the Syrians, and slew 40,000 horsemen, and Shobach, the captain of their host; so the kings that were servants to Hadarezer, made peace with Israel, and the Syrians feared to help the children of Ammon any more. About B.C. 1035, David sent Joab and his servants, and all Israel, and they defeated the children of Ammon, and besieged Rabbah, their metropolis. And Joab took first the royal city, or that part which contained the palace, and the reservoirs and springs of water. And Joab sent messengers to David, and said, I have taken the city of waters, now gather the rest of the Israelites and take Rabbah: lest I take the city and it be called after my name. David took Rabbah, and got the king's crown, the weight whereof was a talent of gold, with the precious stones: and it was set on David's head, and he brought forth the spoil of the city in great abundance. His treatment of the conquered people was harsh and cruel. About B.C. 896, the Ammonites, Moabites, and others came against Jehoshaphat, to battle in Hazazon-tamar, which is En-gedi. Jehoshaphat proclaimed a fast, and Judah gathered themselves together to ask help of the Lord, which came by the discord of the hostile forces. For the children of Ammon and Moab stood up against their comrades, the inhabitants of mount Seir; every one helped to destroy another, and none escaped. And Jehoshaphat and his people stripped off precious jewels from the dead bodies, and riches, more than they could carry away, and they were three days in gathering the spoil. And on the fourth day, they blessed the Lord in the valley of Beracha. Therefore, the name of the same place is called Beracha, which means blessing. And the fear of God was on all the kingdoms, when they heard that the Lord had fought against the enemies of Israel.

(2 Chron. xx.) About B.C. 760, Jotham fought with the king of the Ammonites, and compelled the Ammonites to give him the same year 100 talents of silver, and 10,000 measures of wheat, and 10,000 of barley; so much they paid also the second and the third year. (2 Chron. xxvii.)

From the prophetic writings, we derive some further information as to the history and character of the Ammonites. They are accused by Amos (i. 13.) of the barbarous practice of ripping up women with child. Their destruction is predicted by Isaiah, xi. 14; Zephaniah, ii. 9; Jeremiah, xlix. 1-5; Ezekiel, xxv.

About 600 B.C., bands of the Ammonites came with Nebuchadnezzar against Jerusalem, (2 Kings xxiv. 2.) and exulted in the downfall of their once powerful and inveterate enemy. About 457 B.C., Ezra enforced the Mosaical law (Deut. xxiii. 2.), that an Ammonite should not enter into the congregation of the Lord, even to his tenth generation. Consequently, Ezra separated many Israelites from their Ammonitish wives, (Ezra ix. x.) King Solomon, at an earlier period, had violated the Mosaic law, by having Ammonitish women in his harem. (1 Kings xi. 1.) Ezra's adherence to the law of Moses excited the hostility of the Ammonites to the rebuilding of Jerusalem, which was ridiculed by Tobiah the Ammonite, who said, even that which they build, if a fox go up, he shall even break down their stone wall. (Neh. iv. 3.) Nehemiah, who was also a vigorous reformer, cursed and smote those Israelites who had married wives of Ammon and plucked off their hair (Neh. xiii.), about 434 B.C. Judas the Maccabee fought, during the reign of Antiochus Epiphanes, about 164 B.C., many battles with Timotheos, the mighty captain of the Ammonites, who had much people. Judas took their town, Jazar· (Maccabees v.) Rabbah had been already destroyed by Antiochus the Great. (Polyb. v. 71.) In the days of Justin Martyr, the Ammonites were still very numerous; and in the days of Origen, the Ammonites and Edomites went under the general name of Arabians (lib. v.)

Their metropolis, רַבָּה Rabbah, which we must suppose had been rebuilt, is called by Josephus Ραβαδᾶ, by Eusebius Αμμαν, by Polybius and Stephanus Byzantinus, Ραββατάμμανα, and Philadelphia; and by the Arabians, Am-mān. Abulfeda describes its extensive remains (*Tab. Syriæ, ed.* Köhler, p. 91), which were found by Seetzen under the name of *Robba* and *Rabba.* (Zach's *Monatliche Correspondenz,* xviii. p. 433.) These, however, belong to the Greek period, not to the ruins of ancient Rabba. [See PHILADELPHIA.] The surrounding country was called *Arabia Philadelphiensis.* The bed of Og king of Bashan belonged to the curiosities of Rabbah; but how it got there, we are not told. [See AMORITES.] Nine cubits were the length, and four the breadth thereof, (Deut. iii. 2.)

The Ammonites were uncircumcised (Jer. ix. 26.), and worshipped Molech or Milcom, and their idolatry was, by the Ammonitish wives of Solomon, introduced among the Israelites. (1 Kings xi. 7, 33. 2 Kings xxiii. 13.)

Of their kings, we know only Nahash and Hanun, in the time of David, and Baalis, contemporary with Nebuchadnezzar. (Jer. xl.)

AMMO'NIUM. [See SIWAH.]

AMMO'NIUM, a name proposed by Davy to express the supposed metal which amalgamates with mercury, when it is electrified in contact with ammonia, as already described; he thought it scarcely possible to conceive that a substance, which forms with mercury so perfect an amalgam, should not be metallic.—*Phil. Trans.,* 1808.

Although few chemists have adopted this opinion, its probability is still maintained by Berzelius: he considers ammonium to be a compound of 1 volume of azotic gas and 4 volumes of hydrogen gas; these being nearly the proportions of them contained in the mixture of ammoniacal and hydrogen gases, obtained when the amalgam is decomposed by water.

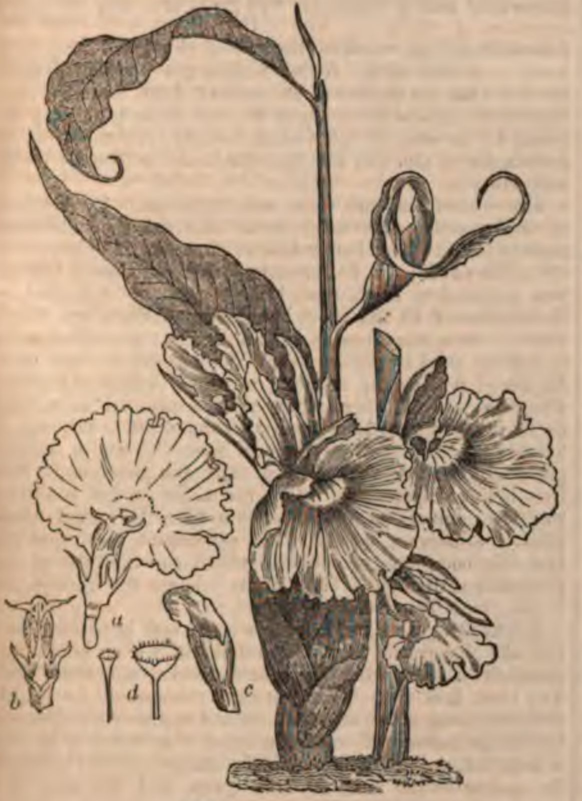
The property of amalgamating with mercury is the only circumstance which denotes an approximation to the nature of a metal in the substance in question; while there are difficulties almost insuperable to such a conclusion. No metal has hitherto been decomposed; mercury is the only substance with which the supposed ammonium has been combined, and it has never been procured in a separate state.

A'MNESTY is a word derived from the Greek ἀμνηστία, which, literally, signifies nothing more than non-remembrance. This word, however, both in the Greek and in the Latin language, into which latter it was introduced, (see *Aurelian. Vopisc.* chap. 39,) acquired a more particular signification, and was used to denote a declaration of the person or persons who had newly acquired or recovered the sovereign power in a state, by which they pardoned all persons who composed, supported, or obeyed the government which had been just overthrown. A declaration of this kind may be either absolute and universal, or it may except certain persons specifically named, or certain classes of persons generally described. Thus, in Athens, when Thrasybulus had destroyed the oligarchy of the Thirty Tyrants, and had restored the democratical form of government, an exceptive amnesty of past political offences was declared, from the operation of which the Thirty themselves, and some few persons who had acted in the most invidious offices under them, were excluded. So when Bonaparte returned from Elba in 1815, he published an amnesty from which he excluded thirteen persons, whom he named in a decree published at Lyons. The act of indemnity, passed upon the restoration of Charles II., by which the persons actually concerned in the execution of his father were excluded from the benefit of the royal and parliamentary pardon, is an instance of an amnesty from which a class of persons were excepted by a general description and not by name. Of a like nature was the law passed by the French Chambers in January, 1816, upon the return of Louis XVIII. to the throne of France after the victory at Waterloo, which offered a complete amnesty to 'all persons who had directly or indirectly taken part in the rebellion and usurpation of Napoleon Bonaparte,' with the exception of certain persons, whose names had been previously mentioned in a royal ordinance as the most active partizans of the usurper. It was objected to this French law of amnesty, that it did not point out with sufficient perspicuity the individuals who were to be excepted from its operation. Instead of confining itself to naming the offenders, it went on to except whole classes of offences, by which means a degree of uncertainty and confusion was occasioned, which much retarded the peaceable settlement of the nation. 'In consequence of this course,' says M. de Chateaubriand in a pamphlet published soon after the event, 'punishment and fear have been permitted to hover over France; wounds have been kept open, passions exasperated, and recollections of enmity awakened.' The act of indemnity, passed at the accession of Charles II., was not liable to this objection, by the distinctness of which, as Dr. Johnson said, 'the flutter of innumerable bosoms was stilled,' and a state of public feeling promoted, extremely favourable to the authority and quiet government of the restored prince.

AMOL, a Persian town in the province of Mazanderan. It stands on the river Herauz, which flows through it, about twelve miles from the southern shore of the Caspian sea, in 36° 30′ N. lat. 52° 23′ 55″ E. long. from Greenwich. There is a bridge of twelve arches, and eight feet in width, over the river, the stream of which is full and rapid. The only interesting building in Amol is the ruin of a mausoleum erected by Shah Abbas over the remains of his maternal ancestor, Seyed Quwām-u-deen, otherwise called Meer Buzoorg, king of Saree and Amol, who died in 1378. It was a structure of considerable magnificence, till the greater part of it was thrown down by an earthquake about twenty years ago. There were formerly other extensive ruins in the town and neighbourhood, but of these the only traces now existing are some mounds of earth. Amol is divided into eight muhulehs or districts, and in the winter, when it is fullest, may contain from 35,000 to 40,000 inhabitants. The houses are between 4000 and 5000 in number. The bazars are large and well supplied; but the only traffic carried on is with the country and villages in the immediate vicinity. Amol is the capital of a government of the same name, which yields a revenue of between 7000*l.* and 8000*l.* sterling. The mountains approach close to the town on the south; the space between it and the sea is thickly covered with wood; there are many groups of houses among the trees, but no regular roads. (See *Travels and Adventures in the Persian Provinces on the southern Banks of the Caspian Sea,* by James B. Fraser, 4to., 1826.)

AMO'MUM, a genus of plants bearing aromatic seeds, and belonging to the natural order *Scitamineæ.* It consists of species having white flowers collected in close heads, which arise from the base of the leaves, and only just raise themselves above the ground; the lower lip of the flower is very broad and large compared with the others, and the other has a two-lobed crest; the seeds are contained in a loose skin, and are enclosed in a rather tough capsule which is separated into three cells by as many membranous partitions, and finally opens into three valves. The leaves are of a broadly lanceolate or oval figure tapering to the point, and enwrapping the stem like a sort of sheath.

The cardamoms, grains of Paradise, and mellagetta pepper of the shops, a class of highly aromatic pungent seeds, are produced by different species of amomum, especially by *A. cardamomum*, and *A. grana Paradisi*. In Sierra Leone there is among other species one called *A. grandiflorum*, the seeds of which have a stimulant flavour resembling that of camphor. The following figure of this and of the cardamom plant will furnish an idea of the general characters of the genus.



[Amomum Grandiflorum.]

a. The lip and a back view of the anther
b. A front view of the anther
c. Calyx.
d. Stigma

[Amomum Cardamomum.]

AMOOD, a pergunnah, belonging to the East India Company, in the province of Gujerat. It is a narrow strip, lying along the eastern shore of the Gulf of Cambay, between the western boundary of the Broach pergunnah and the southern boundary of the Jumbooseer pergunnah, formed by the Dhadur river. Its extreme length is 30, and its general breadth 8 miles; but it is much narrower at the north-east end: its superficial content is 221½ square miles.

This area is partitioned in unequal proportions among 44 villages. Rather more than one-half of the land is under cultivation: a large portion of that which is considered unproductive, consists of an extensive salt-flat, which lies along the north-western boundary of the pergunnah, and adjoins the sea. The only port, Ghundhar, is situated in this quarter; its trade is now insignificant, although the town must at some remote period have been a considerable place, as appears from the extensive ruins around it. The lands of Ghundhar are entirely neglected, not an acre has been cultivated for many years, although much of it is considered fit for tillage: the inhabitants are chiefly occupied in making salt. In the cold season salt is produced in the pans in about a month, but in the warm season the evaporation goes on much more rapidly. The gross produce of the salt-pans is thus divided: 50 per cent. to the government, 35 per cent. to the proprietors of the pans, and the remaining 15 per cent. in various proportions among different native functionaries.

Every foot of land in this and the other pergunnahs of the district belongs to some one or other of the villages of which the pergunnah is composed. The strict observance paid to the preservation of their boundaries by the inhabitants of every village in this quarter is remarkable These boundaries are commonly marked by strips of land 20 or 30 yards in breadth, which are left waste; and though they are sometimes ploughed up by common consent, the line remains as fully recognized as if it bore the most visible marks. Every pergunnah has its own hereditary officers of revenue and record, and every village has its establishment of public servants.

Some part of the soil of Amood is sandy, and of a light brown colour, but the greater part is of superior fertility, and well adapted for wheat, which, with millet, forms the principal food of the inhabitants. The wheat is of the bearded kind, and grows to the height of 18 inches: there are commonly about 50 grains of wheat in each ear. It is sown late in September, or early in October, and ripens in March, when it is pulled up by the roots. An experiment was tried in 1819, to ascertain the produce of wheat, which was ascertained to be equal to only 336 pounds, or 6 bushels per acre. The field on which this experiment was made had been fallow the preceding year, but had not been manured. The seed is sown very thin, at the rate of only two-thirds of a bushel to the acre, and the ripening grain is subject to the depredations of very large birds, called kullums, which visit the country just before harvest in large flocks. Numerous herds of antelopes are also commonly met with, and are very destructive to the crops. A considerable quantity of cotton is produced.

The population of Amood has been ascertained to amount to 16,347 souls, of whom 3203 are Mohamedans, and 13,144 are Hindoos. The number of houses in the pergunnah is 4075; of cows and buffaloes, 5908; of oxen, 4639; of ploughs, 1752, and of carts, 889.

This pergunnah was obtained by cession from the late Peishwa Dowlut Rao Scindia, under the treaty of Poona, dated 13th June, 1817. (Report of Colonel Williams in *Appendix to the Report of the House of Commons* (1832) *on the Affairs of the East India Company.*)

AMORITES (אֱמֹרִי, Ἀμοῤῥαῖοι), the most powerful tribe of the Canaanites, or the aborigines of Palestine. The name Amorites seems sometimes to be used for all the Canaanites, as all the British are by foreigners sometimes called Englishmen. Canaan begat Sidon his first-born, and Heth, and the Jebusite, and the *Amorite*, and the Girgasite, and the Hivite, and the Arkite, and the Sinite, and the Arvadite. These are the sons of Ham. (Gen. x. 15-20.) The Amorites are mentioned among the ten nations whose country was given to the seed of Abraham. (Gen. xv. 19-21.) The Amorites dwelt chiefly in the mountains, which afterwards belonged to the tribe of Judah. (Numb. xiii. 29. Deut. i. 20.) The name אֱמֹרִי has been explained by Simonis and Gesenius by *mountaineer:* אָמִיר means *head, top of a tree,* and أَمِيرٌ *head of a tribe,* emir, chieftain, prince. Perhaps the name was given because the *Amorites* were like *Emirs* at the head of the Canaanitish tribes. Others have translated אֱמֹרִי *amarus, bitter, embittered,* from מרר; or *rebel,* from מרה; or *talking, eloquent,* from אמר. The word אֱמֹרִי occurs in the singular number only, which is often used collectively for the whole Amoritish nation. Some Amorites dwelt in the plains bordering upon the tribe of Dan, and others between the rivers Jordan and Arnon. The river Arnon was the border between Moab and the Amorites. (Num. xxi. 13.) Of the cities of the Amorites it was said to the people of Israel, ' Thou shalt save alive nothing that breatheth: but thou shalt utterly destroy the Hittites, *Amorites,* Canaanites, Perizites, Hivites, and Jebusites, as the Lord thy God has commanded thee, that they teach you not to do after all their abominations, which they have done unto their gods.' (Deut. xx. 16.) Even their sons and their daughters have they burnt in the fire to their gods. (Deut. xii. 31.) ' Whoever of the children of Israel or of the strangers that sojourn in Israel, giveth of his seed unto Moloch shall be put to death.' (Lev. xx. 2.)

The Amorites were of tall stature. According to Amos, (ii. 9.) they were high as cedars and strong as oaks. This poetical description is illustrated by the historical statement, that the size of the iron bedstead of the Amoritish king, Og of Bashan, was nine cubits by four. (Deut. iii. 11.) Hence we may infer, that Og's stature was gigantic, although it did not fill his iron bedstead any more than the Stuarts filled the enormous bedsteads at Hampton Court. But it is most likely that this bedstead, as it is called, was a kind of divan. But the biblical statement could not bridle the flights of rabbinical imagination, who, regardless of the sacred text which they professed to illustrate, surpassed all the extravagancies of Arabian, Persian, and Indian poesy; in the *Jalkut Shimoni,* Moses told the angel of death that Sihon and Og were so vast, that they could not be drowned in the deluge, its waters reaching only to their ancles. Sihon was harder than a wall and taller than any tower, and no creature on earth could withstand his strength. But after the demon with whom he was connected had been chained, Israel was let loose upon him and discomfited him and the Amorites. The Sevachir declares that Og, putting his hand against the windows of heaven, and his feet against the fountains of the great deep, stopped the deluge, until the water being made hot scalded the giant to the bone, who now, mounting the ark, rode out the storm. If Og retained his appetite, he must have been an inconvenient passenger, for his bill of fare was daily 1000 oxen, 1000 head of game, and 1000 measures of wine. According to Berachoth, Og, having ascertained that the camp of Israel was three miles in extent, tore up a sheet of rock of the same size, with the view to crush all arts of war, by putting this extinguisher upon the history of Israel. But whilst Og held the rock over his head it was bored by insects, broken into pieces, which fell on his shoulders, and nearly strangled the giant. Joshua, watching this dilemma, took an axe ten ells long, and being himself ten ells high, he jumped another ten ells, struck Og in the ancle and lamed him for life, until he was finally destroyed at the age of 900 years. (Blackwood's *Magazine,* 1832, p. 744.)

So much seems certain, that in antient times the natives of Syria exceeded in stature the inhabitants of the desert and of Egypt.

The four confederate kings (Genesis xiv.), who plundered Sodom and Gomorrah and took Lot captive, smote also the Amorites that dwelt in Hazzazon Tamar חַצְצֹן־תָּמָר *amputation or cutting of the palm tree,* which place was afterwards called Engeddi, עֵין גֶּדִי *Kid's Eye* or *Kid's Fountain,* on the western borders of the Dead Sea, (B.C. 1913.) Abram dwelt at this time in the plain of Mamre the Amorite, the brother of Eshcol and Aner, Abram's confederates. Hence we perceive that the Amorites chiefly inhabited the country afterwards occupied by the tribe of Judah, (Gen. xiv. 13.) and that they were on friendly terms with Abram.

The inhabitants of Gideon were Amorites. By feigning to send ambassadors from a great distance they obtained peace with the Israelites under Joshua about the year B.C. 1451. (See Joshua ix.) For making this confederacy Gibeon was attacked by five kings of the Amorites; but Joshua chased them from Gibeon to Bethhoron, Azekah, and Makkedah, where, according to Joshua, (x. 11.) more died from hailstones than by the sword of the Israelites. But after all this, the Amorites retained so much power, that they forced (B.C. 1425) the children of Dan into the mountain, for they would not suffer them to come down to the valley. ' But the Amorites would dwell in Mount Heres in Ajalon, and in Shaalbim; yet the house of Joseph prevailed so that they became tributaries. And the coast of the Amorites was from the going up to Akrabim, from the rock and upward.' (Judges i. 34-36.) The remarkable fact, that the Israelites conquered the mountains sooner than the plains is explained (Judges i. 19.): it was because the inhabitants of the plain had chariots of iron.

About the year B.C. 1120 there was peace between Israel and the Amorites. The Gibeonites (to whom seven descendants of Saul were delivered by David about the year B.C. 1020, that they might revenge themselves for Saul's atrocities) were of the remnant of the Amorites whom Joshua had made hewers of wood and drawers of water. (Jos. ix.; 2 Sam. xx.) Another branch of the Amorites dwelt between the rivers Jordan and Arnon. (Num. xxi. 13., xxii. 36.; Judges xi. 18.) Here Moses and the children of Israel had smitten two kings of the Amorites, namely, Sihon, who dwelt at Heshbon, and Og, king of Bashan, in the plain east of Jordan. These kings had refused to let the Israelites pass through their borders. But it appears that these Amorites were not extirpated, and that their descendants formed, even during the time of the Maccabees, a distinct tribe; for we read in Josephus's *Antiquit.* (xiii. chap. 1.) that the Amorites (Ἀμαραίου παῖδες) from Medaba fell suddenly upon the corps of Johannes Gaddis, when he was conveying, according to the command of his brother Jonathan, the baggage of the Jewish host to the Nabathaean Arabs who roved between the Euphrates and the Red Sea. Simon and Jonathan revenged the death of their brother Johannes by falling suddenly upon the splendid train of an Amoritish bridegroom who was leading his bride, the daughter of a rich Arabian, from Gabatha to Medaba. On this occasion 400 men, women and children were killed.

AMOS, the prophet, was a native of the town of Thekoa, which was about six miles south of Bethlehem. He was not a prophet's son, but a herdsman, and a gatherer of sycamore fruit, and the Lord took him as he followed the flock, to prophesy unto Israel. (Amos vii. 14, 15.) Therefore, Amos mentions the kingdom of Judah only incidentally, and hence Dr. Coke, Dr. Adam Clarke, and several commentators before them have vaguely conjectured Amos to be a native of the kingdom of Israel. Amos saw his visions concerning Israel in the days of Uzziah, King of Judah, and in the days of Jeroboam II., King of Israel, two years before the earthquake. (Amos i. 1.) This earthquake is mentioned by Zechariah, (xiv. 5.) ' Ye shall flee, like as ye fled from before the earthquake in the days of Uzziah, King of Judah,' which happened, according to the opinions of the later Jews, when Uzziah went into the temple to burn incense upon the altar, and Azariah, the priest, went in after him, and with him fourscore priests, valiant men who withstood Uzziah, and said, it appertaineth not unto thee to burn incense, but to the priests that are consecrated: go out of the sanctuary. Then Uzziah was wroth, leprosy rose in his forehead, and the priests thrust him out from thence. (2 Chron. xxvi.) According to Josephus, (*Antiquit.* ix. 10. § 4.) the earthquake began during the king's altercation with the priests. A ray of the sun, according to the story, fell through a fissure of the temple into the face of the king and struck him with leprosy. The western part of Mount Olivet rolled four stadia or furlongs to the east side of the mountain, covered many streets and destroyed the king's gardens.

It is probable that the prophecies of Amos were delivered between the years 798—784 before Christ.

With this period, the contents of the book of Amos agree, for the borders of Israel extended from Hamath to the Arnon (Amos vi. 14.), and the vices, which the prophet denounces, are such as usually predominate during periods of temporal prosperity and security Isaiah, Hosea, and Amos were contemporaries. The opinion that Isaiah, a member of the royal family, was a son of Amos the herdsman, arose from a confusion of the prophet whose name is *Gamos* עָמוֹס (signifying, burden or burdened) with the word אָמוֹץ (strong) *Amots*, the name of the father of Isaiah. The Greeks wrote both names Amōs.

In the Book Περὶ τῶν προφητῶν πῶς ἐκοιμήθησαν καὶ ποῦ κεῖνται, which has been published with the works of Epiphanius, who was bishop of Constantia, in Cyprus, at the end of the fourth century, we read that Amos, born at Thekoa, in the land of Zebulon, the father of Isaiah, was wounded with a sword by Amaziah the priest, at Bethel, whom he had reproved for worshipping calves. The son of Amaziah struck him with a bludgeon on the head, so that he died two days after returning to his country, where he was buried with his fathers. The land of Zebulon may here signify the *sandy region*, the desert of Thekoa, which extends from the south of Jerusalem to the Persian Gulph, at the entrance of which Thekoa was situated, surrounded with tolerable pastures. Or it means the country of שׁוֹבָל the Idumean, Gen. xxxvi. 20, which the Latins called *terra Sobail.* (See H. A. Hamakeri, *Commentatio in libellum de vita et morte Prophetarum.* Amst. 1833. In *Instituti regii Commentariis.*)

Many having repeated St. Jerome's saying, that Amos was 'rude in speech, but not in knowledge,' Bishop Louth, in his twenty-first lecture, shows that Amos was not behind the chief prophets in eloquence. The book of Amos is written in an excellent Hebrew style, but the orthography differs occasionally from the usual standard. Amos, the herdsman, has taken many figures from pastoral life, but he alludes also to history, geography, and astronomy. Thus we see that knowledge, in olden times, was not confined to those who, like Isaiah, were of the blood royal, or priests like Jeremiah, but extended sometimes even to herdsmen.

Chapters i. ii. describe the approaching judgment of Jehovah, which rolls like a thunder-storm over the surrounding states, Damascus, Philistia, Tyrus, Edom, Ammon, Moab, touches upon Judah, and halts over Israel, on account of its injustice, immorality, idolatry, and stubbornness against the providence of Jehovah.

Chapters iii., iv., v., and vi. contain the predictions of the punishment of Israel; and chapters vii.—ix. visions of judgment, in which is interwoven the history of Amaziah's opposition, who said unto Amos, O thou seer, go, flee thee away into the land of Judah, and there eat bread, and prophesy there.

The canonical authority of Amos rests upon the internal character of his work, upon the united testimony of the Jewish and Christian church, and upon the use which the apostles made of Amos (v. 25, 26, in Acts vii. 42., Amos ix. 11., and in Acts xv. 16.). Philo, Josephus, and the fathers quote Amos among the minor prophets, and even the author of the book of Tobit (ii. 6.) quotes a passage from Amos, mentioning his name.

AMOY, a celebrated port of China, in the province of Fo-kien, in 20° 45′ north latitude and 118° east longitude. In Mandarin dialect, the name of the place is Hea-mun, which is pronounced by the natives Ha-moy.

The district in which this flourishing town, the emporium of the commerce of the province, is situated, is one of the most barren in all China, and not only yields nothing for exportation, but is dependent even for the necessaries of life on the neighbouring island of Formosa, which has been described as the granary of the eastern coast of China. Notwithstanding this serious disadvantage, the merchants of Amoy are among the most wealthy and enterprising in the Chinese empire; they have formed connexions all along the coast, and have established commercial houses in many parts of the eastern archipelago. Most of the Formosian colonists emigrated from the district of Amoy, with capital supplied by its merchants, and in proportion as the island has flourished, so has Amoy increased in wealth and importance.

During the south-west monsoon, the merchants of Amoy freight their vessels at Formosa with sugar, which they sell at various ports to the northward, returning home with cargoes of drugs. They maintain commercial relations with Manilla, as well as with Tonquin and Cochin China: they annually employ forty large junks in trading with Bankok, the capital of Siam. Junks of the largest class—some of them 800 tons burden—go to Borneo, Macassar, Java, and the Soo-loo islands; and many of them annually visit Sincapore, in order to procure goods of British manufacture.

This port has not always been closed against European vessels. According to the records of the East India Company,—'The King of Tywan, on taking Amoy in 1675, issued a proclamation inviting both Chinese and foreign merchants to trade thither, exempting them from the payment of all duties for three years.' Many vessels, in consequence, resorted to the port, but the exemption was speedily revoked. In 1681, the town was taken by the Tartars, but Europeans were still allowed to trade thither, and continued to do so until 1734, when the exactions of the Mandarins deterred them from continuing so unprofitable an intercourse; and when an English ship went there, ten years after, many vain endeavours and much fruitless discussion were employed to induce the Chinese to trade, so that the vessel was obliged to proceed to Bengal for a cargo.

The ship Amherst visited Amoy last year (1832) with no better success; it appears, however, that the obstacles to her trading all proceeded from the authorities, and not from the people, by whom our countrymen were received in the most friendly manner. The harbour of Amoy is spacious and secure. (Lords' *Report of* 1820-21, *relative to the Trade with the East Indies and China; and Report of Proceedings on a Voyage in the Ship Amherst to the Northern Ports of China*, by Mr. H. H. Lindsay.)

AMPELI'DEÆ, one of the names of the vine tribe. [See VITES.]

AMPHI'BIA, (from the Greek word ἀμφίβιος, which signifies *having a double life*,) a zoological term employed in different senses by different writers. In common conversation we are accustomed to call all mammals, such as seals, otters, beavers, &c., amphibious, whose organization disposes them to resort indifferently either to the land or water for procuring food and other purposes, or whose habits are at once terrestrial and aquatic; thus we usually denominate the common campagnol (*Arvicola amphibia*) and white-bellied shrew (*Sorex fodiens*), the water-rat and water-shrew respectively, and consider them in every respect as amphibious animals. But in this sense of the word every land-animal is more or less amphibious, for all resort occasionally to the water, and with the single exception of man, all appear to have an instinctive power of swimming. Previous to the time of Linnæus, the earlier naturalists attached no more definite meaning to the word than that which was sanctioned by popular custom, and which, it will be observed, is more properly expressed by the term aquatic. The great Swedish philosopher, however, rejected this vague and improper signification, and applied the term generally to the third class of his system of zoology, which comprised not only all the animals since more properly denominated reptiles, such as the tortoises, lizards, serpents, and frogs, but likewise the cartilaginous fishes. Linnæus was evidently ignorant of the true characters and natural limits of this class of animals; the term amphibia was certainly very applicable to many of the genera and species which it embraced, but with regard to the great majority of them it was an absolute misnomer. The shark and the ray are as incapable of existing out of the water, as many of the common lizards are of living in it, and consequently neither the group which Linnæus proposed to establish, nor the name by which he designated it, has been adopted by more recent zoologists. The cartilaginous fishes have been referred to the other aquatic tribes, with which their habits and organic conformation naturally connect them, and the remainder of the class, which stands in Gmelin's celebrated edition of the *Systema Naturæ* under the name amphibia, is admitted into modern systems under the more appropriate designation of reptiles.

Taken in its strict and literal sense, the term amphibious would apply only to such animals as have the power of living indifferently, at the same time, either upon land or in water. To fulfil this condition it is necessary that a truly amphibious animal should be provided with the means of breathing in either of these elements, that is, that it should simultaneously possess both lungs and gills. Now there are four genera of batrachian reptiles which actually do possess this extraordinary double apparatus for extracting the principle which supports animal life indifferently from either element; and these, as Baron Cuvier has justly observed, comprise in reality the only known vertebrated animals which are truly amphibious. They are the *axolotls*, the *menobranchi*, and the *sirens*, all of which inhabit the rivers and lakes of America, and the *proteus* which is found in subterraneous streams connecting certain lakes in Carniola and Hungary. 'The existence and simultaneous action of gills and lungs in these animals,' says Baron Cuvier, in a note to the *Règne Animal*, 'can no longer be doubted as one of the most clearly established facts in natural history; I have before me the lungs of a siren of three feet in length, in which the vascular apparatus is as well developed and as complicated as in any other reptile, yet nevertheless this siren had gills as complete as any other species.' These then are the only strictly amphibious reptiles; but if we were disposed to take the term in a little more extended sense, it might, without impropriety, be applied to the entire order of reptiles which M. Brongniart, and after him all modern naturalists, denominate *batrachians*, because all these animals, without exception, breathe by means of gills in their tadpole state, and only acquire lungs when they assume the more mature and perfect form of reptiles.

Beyond this, however, the term cannot with propriety be extended to the reptiles in general, because these animals, though the limited quantity of their respiration enables them to remain under water for a much longer period than birds or mammals, can no more absolutely dispense with breathing than the higher classes, and like them would inevitably be drowned if prevented for any length of time from coming to the surface to breathe. For further information upon this subject, see REPTILE, BATRACHIANS, and AQUATIC ANIMALS.

AMPHIBOLI'TE, a name sometimes given to the simple mineral more commonly called hornblende, and which was introduced by Haüy, the mineralogist, who uselessly changed many names. He called hornblende *amphibole*, because it is easily mistaken for augite, another simple mineral closely allied to it in composition, from ἀμφίβολος, *amphibolos*, equivocal.

AMPHI'CTYONS, members of a celebrated council in ancient Greece, called the Amphictyonic Council.

According to the popular story, this council was founded by Amphictyon, son of Deucalion, who lived, if he lived at all, many centuries before the Trojan war. It is supposed by a writer quoted by Pausanias, x. 8., to derive its name, with a slight alteration, from a word signifying 'settlers around a place.' Strabo, who professes to know nothing of its founder, says that Acrisius, the mythological king of Argos, fixed its constitution, and regulated its proceedings. Amidst the darkness which hangs over its origin, we discover with certainty, that it was one of the earliest institutions in Greece. No full or clear account has been given of it during any period of its existence by those who had the means of informing us. The fullest information is supplied by Æschines the orator; but before any attempt is made, by the help of some short notices from other writers, and of conjecture, to trace its earlier history, it may not be amiss to state what is certainly known of this council as it existed in his time.

According to Æschines, the Greek nations which had a right to be represented in the council, were the Thessalians, Bœotians, Dorians, Ionians, Perrhæbians, Magnesians, Locrians, Œtæans, Phthiots, Malians, Phocians. Each nation was represented by certain sovereign states, of which it was supposed to be the parent: thus Sparta, conjointly with other Dorian states, represented the Dorian nation. Amongst the states thus united in representing their common nation, there was a perfect equality. Sparta enjoyed no superiority over Dorium and Cytinium, two inconsiderable towns in Doris, and the deputies of Athens, one of the representatives of the Ionian nation, sat in the council on equal terms with those of Eretria in Eubœa, and of Priene, an Ionian colony in Asia Minor. From a rather doubtful passage in Æschines, *De Fals. Leg.*, 43. compared with a statement in Diodorus, xvi. 60. it seems that each nation, whatever might be the number of its constituent states, had two, and only two votes. The council had two regular sessions in each year, meeting in the spring at Delphi, and in the autumn near Pylæ, otherwise called Thermopylæ; but special meetings were sometimes called before the usual time. From its meeting at Pylæ, a session of the Amphictyons was called a Pylæa, and the deputies were called Pylagoræ, that is, councillors at Pylæ. There were also deputies distinguished by the name of Hieromnemons, whose office it was, as their name implies, to attend to matters pertaining to religion. Athens sent three Pylagoræ and one Hieromnemon. The former were appointed for each session; the latter probably for a longer period, perhaps for the year, or two sessions. The council entertained charges laid before it in relation to offences committed against the Delphic god, made decrees thereupon, and appointed persons to execute them. These decrees, as we learn from Diodorus, xvi. 24. were registered at Delphi. The oath taken by the deputies bound the Amphictyons not to destroy any of the Amphictyonic cities, or to debar them from the use of their fountains in peace or war; to make war on any who should transgress in these particulars, and to destroy their cities; to punish with hand, foot, voice, and with all their might, any who should plunder the property of the god, (the Delphic Apollo,) or should be privy to, or devise anything against that which was in his temple. This is the oldest form of the Amphictyonic oath which has been recorded, and is expressly called by Æschines the ancient oath of the Amphictyons. It has inadvertently been attributed to Solon by Mr. Mitford, who has apparently confounded it with another oath imposed on a particular occasion. An ordinary council consisted only of the deputed Pylagoræ and Hieromnemons; but on some occasions at Delphi, all who were present with the Amphictyonic deputies to sacrifice in the temple and consult the oracle of the god, were summoned to attend, and then it received the name of an *ecclesia* or assembly. Beside the list of Amphictyonic nations given by Æschines, we have one from Pausanias which differs a little from that of Æschines, and another from Harpocration which differs slightly from both. The orator, whilst he speaks generally of twelve nations, names only eleven. Strabo agrees with him in the larger number. It is further remarkable, that whilst Æschines places the Thessalians at the head of his list, Demosthenes, *De Pac.* p. 62. expressly excludes them from a seat in the council.

Æschines has left us much in the dark as to the usual mode of proceeding in the Amphictyonic sessions; and we shall look elsewhere in vain for certain information. It should seem that all the Pylagoræ sat in the council and took part in its deliberations; but if the common opinion mentioned above, respecting the two votes allowed to each nation, be correct, it is certain that they did not all vote. The regulations according to which the decisions of the twelve nations were made can only be conjectured. We know that the religious matters which fell under the jurisdiction of the Amphictyonic body were managed principally, at least, by the Hieromnemons, who appear, from a verse in Aristophanes, *Nub.* 613., to have been appointed by lot, but we are not as well informed respecting the limits which separated their duties from those of the Pylagoræ, nor respecting the relative rank which they held in the council. (See Æsch. *contr. Ctes.* p. 68—72. *Fals. Leg.* p. 43.) The little that is told is to be found for the most part in the ancient lexicographers and scholiasts, or commentators, who knew perhaps nothing about the matter, and whose accounts are sufficiently perplexing to give room for great variety of opinions among modern writers. Some have seemed to themselves to discover that the office of the Hieromnemons was of comparatively late creation, that these new deputies were of higher rank than the Pylagoræ, and that one of them always presided in the council; others again have supposed, what, indeed, an ancient lexicographer has expressly asserted, that they acted as secretaries or scribes. Two Amphictyonic decrees are found at length in the oration of Demosthenes on the Crown, both of which begin thus: 'When Cleinagoras was priest, at the vernal Pylæa, it was resolved by the Pylagoræ and the Synedri (joint councillors) of the Amphictyons, and the common body of the Amphictyons.' Some have assumed that Cleinagoras the priest was the presiding Hieromnemon, and others that the Hieromnemons are comprehended under the general name of Pylagoræ. Æschines again has mentioned a decree in which the Hieromnemons were ordered to repair at an appointed time to a session at Pylæ, carrying with them the copy of a certain decree lately made by the council. Of the council, as it existed before the time of Æschines, a few notices are to be found in the ancient historians, some of which are not unimportant. According to Herodotus, vii. 200. the council held its meetings near Thermopylæ, in a plain which surrounded the village of Anthela, and in which was a temple dedicated to the Amphictyonic Ceres; to whom, as Strabo tells us, ix. 429. the Amphictyons sacrificed at every session. This temple, according to Callimachus, *Ep.* 41. was founded by Acrisius; and hence arose, as Müller supposes in his history of the Dorians, (vol. i. p. 289, English translation,) the tradition mentioned above.

We are told by Strabo, ix. 418. that after the destruction of Crissa by an Amphictyonic army, under the command of Eurylochus, a Thessalian prince, the Amphictyons instituted the celebrated games, which from that time were called the Pythian, in addition to the simple musical contests already established by the Delphians. Pausanias also, x. 7., attributes to the Amphictyons, both the institution and subsequent regulation of the games; and it is supposed by the most skilful critics, that one occasion of the exercise of this authority, recorded by Pausanias, can be identified with the victory of Eurylochus, mentioned by Strabo. According to this supposition, the Crissæan, and the celebrated Cirrhæan war, are the same, and Eurylochus must have lived as late as B.C. 591. But the history of these matters is full of difficulty, partly occasioned by the frequent confusion of the names of Crissa and Cirrha.

From the scanty materials left us by the ancient records, the following sketch of the history of this famous council is offered to the reader, as resting on some degree of probability:—

The council was originally formed by a confederacy of Greek nations or tribes, which inhabited a part of the country afterwards called Thessaly. In the lists which have come down to us of the constituent tribes, the names belong for the most part to those hordes of primitive Greeks which are first heard of, and some of which continued to dwell north of the Malian bay. The bond of union was the common worship of Ceres, near whose temple at Anthela its meetings were held. With the worship of the goddess was afterwards joined that of the Delphic Apollo; and thenceforth the council met alternately at Delphi and Pylæ. Its original seat and old connexions were kept in remembrance by the continued use of the term Pylæa, to designate its sessions wherever held; though eventually the Delphic god enjoyed more than an equal share of consideration in the confederacy. It may be remarked that the Pythian Apollo, whose worship in its progress southwards can be faintly traced from the confines of Macedonia, was the peculiar god of the Dorians who were of the Hellenic race; whilst the worship of Ceres was probably of Pelasgic origin, and appears at one time to have been placed in opposition to that of Apollo, and in great measure to have retired before it. There is no direct authority for asserting that the joint worship was not coeval with the establishment of the council; but it seems probable from facts, which it is not necessary to examine here, that an Amphictyonic confederacy existed among the older residents, the worshippers of Ceres, in the neighbourhood of the Malian bay, before the hostile intruders with their rival deity were joined with them in a friendly coalition. The council met for religious purposes, the main object being to protect the temples and maintain the worship of the two deities. With religion were joined, according to the customs of the times, political objects; and the jurisdiction of the Amphictyons extended to matters which concerned the safety and internal peace of the confederacy. Hence the Amphictyonic laws, the provisions of which may be partly understood from the terms of the Amphictyonic oath. Confederacies and councils, similar to those of the Amphictyons, were common among the ancient Greeks. Such were those which united in federal republics the Greek colonists of Asia Minor, of the Æolian, Ionian, and Dorian nations. Such also was the confederacy of seven states whose council met in the temple of Neptune in the island of Calauria, and which is even called by Strabo, viii. 374, an Amphictyonic council.

The greater celebrity of the northern Amphictyons is attributable partly to the superior fame and authority of the Delphic Apollo; still more, perhaps, to their connexion with powerful states which grew into importance at a comparatively late period. The migrating hordes, sent forth from the tribes of which originally or in very early times the confederacy was composed, carried with them their Amphictyonic rights, and thus at every remove lengthened the arms of the council. The great Dorian migration especially planted Amphictyonic cities in the remotest parts of Southern Greece. But this diffusion, whilst it extended its fame, was eventually fatal to its political authority. The early members, nearly equal perhaps in rank and power, whilst they remained in the neighbourhood of Mounts Œta and Parnassus, might be willing to submit their differences to the judgment of the Amphictyonic body. But the case was altered when Athens and Sparta became the leading powers in Greece. Sparta, for instance, would not readily pay obedience to the decrees of a distant council, in which the deputies of some inconsiderable towns in Doris sat on equal terms with their own. Accordingly in a most important period of Grecian history, during a long series of bloody contests between Amphictyonic states, we are unable to discover a single mark of the council's interference. On the other hand, we have from Thucydides i. 112, a strong negative proof of the insignificance into which its authority had fallen. The Phocians (B. C. 448) possessed themselves by force of the temple of Apollo at Delphi; were deprived of it by the Lacedæmonians, by whom it was restored to the Delphians; and were again replaced by the Athenians. In this, which is expressly called by the historian a sacred war, not even an allusion is made to the existence of an Amphictyonic council. After the decay of its political power there still remained its religious jurisdiction; but it is not easy to determine its limits or the objects to which it was directed. In a treaty of peace made (B. C. 421) between the Peloponnesians and the Athenians (Thucyd. v. 17), it was provided that the temple of Apollo at Delphi, and the Delphians, should be independent. This provision, however, appears to have had reference especially to the claims of the Phocians to include Delphi in the number of their towns, and not to have interfered in any respect with the superintendence of the temple and oracle, which the Amphictyons had long exercised in conjunction with the Delphians. We have seen that the Amphictyons were charged in the earliest times with the duty of protecting the temple and the worship of the god. But the right of superintendence, of regulating the mode of proceeding in consulting the oracle, in making the sacrifices, and in the celebration of the games, was apparently of much later origin, and may, with some probability, be dated from the victory gained by Eurylochus and the Amphictyonic army. The exercise of this right had the effect of preserving to the council permanently a considerable degree of importance. In early times the Delphic god had enjoyed immense authority. He sent out colonies, founded cities, and originated weighty measures of various kinds. Before the times of which we have lately been speaking, his influence had been somewhat diminished; but the oracle was still most anxiously consulted both on public and private matters. The custody of the temple was also an object of jealous interest on account of the vast treasures contained within its walls.

The Greek writers, who notice the religious jurisdiction of the council, point our attention almost exclusively to Delphi; but it may be inferred from a remarkable fact mentioned by Tacitus, *Ann.* iv. 14, that it was much more extensive. The Samians, when petitioning in the time of the Emperor Tiberius for the confirmation of a certain privilege to their temple of Juno, pleaded an ancient decree of the Amphictyons in their favour. The words of the historian seem to imply that the decree was made at an early period in the existence of Greek colonies in Asia Minor, and he says that the decision of the Amphictyons on all matters had at that time pre-eminent authority.

The sacred wars, as they were called, which were originated by the Amphictyons in the exercise of their judicial authority, can here be noticed only so far as they help to illustrate the immediate subject of inquiry. The Cirrhæan war, in the time of Solon, has already been incidentally mentioned. The port of Cirrha, a town on the Crissæan bay, afforded the readiest access from the coast to Delphi. The Cirrhæans, availing themselves of their situation, grievously oppressed by heavy exactions the numerous pilgrims to the Delphic temple. The Amphictyons, by direction of the oracle, proclaimed a sacred war to avenge the cause of the god; that is, to correct an abuse which was generally offensive, and particularly injurious to the interests of the Delphians. Cirrha was destroyed, the inhabitants reduced to slavery, their lands consecrated to Apollo, and a curse was pronounced on all who should hereafter cultivate them. We are told that Solon acted a prominent part on this occasion, and that great deference was shown to his counsels. Mr. Mitford, indeed, has discovered without help from history, which is altogether silent on the subject, that he was the author of sundry important innovations, and that he in fact remodelled the constitution of the Amphictyonic body. He has even been able to catch a view of the secret intentions of the legislator, and of the political principles which guided him. But in further assigning to Solon the command of the Amphictyonic army, he is opposed to the direct testimony of the ancient historians.

From the conclusion of the Cirrhæan war to the time of Philip of Macedon, an interval exceeding two centuries, we hear little more of the Amphictyons, than that they rebuilt the temple at Delphi, which had been destroyed by fire B.C. 548; that they set a price on the head of Ephialtes, who betrayed the cause of the Greeks at Thermopylæ, and conferred public honours on the patriots who died there; and that they erected a monument to the famous diver Scyllias as a reward for the information which, as the story goes, he conveyed under water from the Thessalian coast to the commanders of the Grecian fleet at Artemisium. If Plutarch may be trusted, the power of the Amphictyons had not at this time fallen into contempt. When a proposition was made by the Lacedæmonians to expel from the council all the states which had not taken part in the war against the Persians, it was resisted successfully by Themistocles, on the ground that the exclusion of three considerable states, Argos, Thebes, and the Thessalians, would give to the more powerful of the remaining members a preponderating influence in the council dangerous to the rest of Greece.

After having, for a long period, nearly lost sight of the Amphictyons in history, we find them venturing, in the fallen fortunes of Sparta, to impose a heavy fine on that state as a punishment for an old offence, the seizure of the Theban Cadmeia, the payment of which, however, they made no attempt to enforce. In this case, as well as in the celebrated Phocian war, the Amphictyonic council can be considered only as an instrument in the hands of the Thebans, who after their successful resistance to Sparta, appear to have acquired a preponderating influence in it, and who found it convenient to use its name and authority, whilst prosecuting their own schemes of vengeance or ambition. Though the charge brought against the Phocians was that of impiety in cultivating a part of the accursed Cirrhæan plain, there is no reason to think that any religious feeling was excited, at least in the earlier part of the contest; and Amphictyonic states were eagerly engaged as combatants on both sides. For an account of this war, the reader is referred to a general history of Greece. The council was so far affected by the result, that it was compelled to receive a new member, and in fact a master, in the person of Philip of Macedon, who was thus rewarded for his important services at the expense of the Phocians, who were expelled from the confederacy. They were, however, at a subsequent period restored, in consequence of their noble exertions in the cause of Greece and the Delphic God against the Gauls. It may be remarked, that the testimony of the Phocian general Philomelus, whatever may be its value, is rather in favour of the supposition that the council was not always connected with Delphi. He justifies his opposition to its decrees, on the ground that the right which the Amphictyons claimed was comparatively a modern usurpation. In the case of the Amphissians, whose crime was similar to that of the Phocians, the name of the Amphictyons was again readily employed; but Æschines, who seems to have been the principal instigator of the war, had doubtless a higher object in view than that of punishing the Amphissians for impiety.

The Amphictyonic council long survived the independence of Greece, and was, probably, in the constant exercise of its religious functions. So late as the battle of Actium, it retained enough of its former dignity at least, to induce Augustus to claim a place in it for his new city of Nicopolis. Strabo says that in his time it had ceased to exist. If his words are to be understood literally, it must have been revived; for we know from Pausanias (x. 8.), that it was in existence in the second century after Christ. It reckoned at that time twelve constituent states, who furnished in all thirty deputies; but a preponderance was given to the new town of Nicopolis, which sent six deputies to each meeting. Delphi sent two to each meeting, and Athens, one deputy: the other states sent their deputies according to a certain cycle, and not to every meeting. For the time of its final dissolution, we have no authority on which we can rely.

It is not easy to estimate with much certainty the effects produced on the Greek nation generally, by the institution of this council. It is, however, something more than conjecture, that the country which was the seat of the original members of the Amphictyonic confederacy, was also the cradle of the Greek nation, such as it is known to us in the historical ages. This country was subject to incursions from barbarous tribes, especially on its western frontier, probably of a very different character from the occupants of whom we have been speaking. In the pressure of these incursions, the Amphictyonic confederacy may have been a powerful instrument of preservation, and must have tended to maintain at least the separation of its members from their foreign neighbours, and so to preserve the peculiar character of that gifted people, from which knowledge and civilization have flowed over the whole western world. It may also have aided the cause of humanity; for it is reasonable to suppose that in earlier times, differences between its own members were occasionally composed by interference of the council; and, thus, it may have been a partial check on the butchery of war, and may at least have diminished the miseries resulting from the cruel lust of military renown. In one respect, its influence was greatly and permanently beneficial. In common with the great public festivals, it helped to give a national unity to numerous independent states, of which the Greek nation was composed. But it had a merit which did not belong to those festivals in an equal degree. It cannot be doubted that the Amphictyonic laws, which regulated the originally small confederacy, were the foundation of that international law which was recognised throughout Greece; and which, imperfect as it was, had some effect in regulating beneficially national intercourse among the Greeks in peace and war, and, so far as it went, was opposed to that brute force and lawless aggression, which no Greek felt himself restrained by any law from exercising towards those who were not of the Greek name. To the investigator of that dark but interesting period in the existence of the Greek nation, which precedes its authentic records, the hints which have been left us on the earlier days of this council, faint and scanty as they are, have still their value. They contribute something to those fragments of evidence with which the learning and still more the ingenuity of the present generation are converting mythical legends into a body of ancient history.

AMPHIDESMA, among zoologists, is the name of a genus of marine bivalve shells, which live in the sand on the sea-coast of tropical climates. The shells are oval or rounded, sometimes rather twisted and slightly gaping behind. They have two hinge teeth in each valve, and often distinct compressed lateral ones. The elastic cartilage is placed in a small triangular cavity just behind the hinge teeth. The animals of these shells are unknown; but they are supposed to have long syphons, like the Tellens, as the shells have a broad, deep inflation on the back edge of the submarginal scar, formed by the attachment of the muscles which retract these syphons, as in the Tellens, from which genus it simply differs in the position of its cartilage.

Lamarck gave the name of *Amphidesma* to this genus, because he observed that it had a ligament and a cartilage, which he regarded as peculiar to this genus, he having, like the rest of the zoologists before the appearance of the

Conchological Observations in the *Zoological Journal*, considered what is usually called the ligament of bivalves as only one substance. It is, however, two substances, of very different structure and use; the outer, or ligament, being inelastic, and only employed to keep the two valves together, is formed of fibres extending from the edge of one valve to the other; but the cartilage is elastic and formed of perpendicular fibres, like the prismatic crystalline-structured shell, its use being to separate the valves from one another when the muscles which keep them closed are relaxed. When the valves are closed, this part is compressed by their edge. For this purpose it is sometimes, as in the shell under consideration, placed in a small triangular cavity close to the hinge, when the shell is said to have an internal cartilage, the ligament being still in its usual place. In other shells it is placed, along with the ligament, on the margin of the valves, and is pressed, when the valves are closed, against the ligament itself, which forms its outer wall. The resistance which the ligament offers is the means of opening the shell. The cartilage has opaline reflections, and the cartilages of some large shells, as the mother-of-pearl shells, are sold by the jewellers under the name of *Peacock-stone*, or *black opals*. They are not so much used now as formerly, but they are still much sought after on the Continent, especially in Portugal.

AMPHILA, BAY OF, a bay extending for about sixteen miles along the west coast of the Red Sea, in 14° 30′ N. lat. and 41° E. long. from Greenwich. Mr. Salt has given a chart of it on a large scale, from a survey, in his *Voyage to Abyssinia*, quarto, London, 1814. There are thirteen islands in the bay, the largest of which, called also Amphila, lying near its south-eastern extremity, is not quite a mile in length. Of these islands one only is a rock of calcareous stone; the others are all composed of corallines, madrepores, and other marine alluvia, strongly cemented together, and covered with a thin layer of soil. None of them are now inhabited, though on one, called Kutto, there are the ruins of some houses. On the main land at the bottom of the bay is the village of Duroro, and farther to the south-east, the smaller village of Madir. Between these and the sea is a sort of thick jungle of rack trees. This district was formerly part of the old kingdom of Dankali, and still retains that name. Mr. Salt thinks it probable that Amphila is not a native word, but a corruption of the Greek 'Αντιφίλου λιμὴν, mentioned by Strabo. Casaub. p. 771. (Salt's *Abyssinia*, chap. iv.)

AMPHI′POLIS, an ancient Greek city, on the left or eastern bank of the river Strymon, just below its egress from the lake Kerkine, now called Takino, and about three miles above its influx to the sea. This town was at first called Ennea Hodoi (the nine ways), and belonged to the Edonians, a Thracian people. The first attempt at colonization here was by Aristagoras of Miletus, who failed in the attempt, (B.C. 497.)

The Athenians next made an unsuccessful attempt, (B.C. 465,) and sustained a severe loss, but they took Ennea Hodoi in the year 437 B.C., and established there a colony. They enlarged and fortified the town, to which Hagnon, the leader of the colony, gave the name of Amphipolis, because the river Strymon flowed round a large part of it, forming nearly a circle; a wall was built across, and thus the town was defended on every side. This is Thucydides' account, (lib. iv. cap. 102) which some geographers have interpreted as if the town had stood between two branches of the river, which do not exist. In several maps, also, the Angitas, which flows from the eastward into the lake Kerkine, is mistaken for the Strymon which enters it from the north. The latter is called Struma by the Bulgarian inhabitants who are very numerous in this district. During the Peloponnesian war, (B.C. 424,) the Lacedæmonians, under their general Brasidas, took Amphipolis. Cleon, being sent by the Athenians to retake it, was beaten by Brasidas in a combat under the walls of the town, where both generals lost their lives. The importance of Amphipolis was derived from its situation on the banks of a navigable river, a short distance from the sea, and from its neighbourhood to the gold mines of Mount Pangæus, and to the fine forests of Kerkine, from which, even now, many cargoes of timber are annually shipped at the mouth of the Strymon. Amphipolis was taken by Philip, king of Macedonia. Amphipolis has long been in ruins, and a village of about 100 houses, called Jeni-Keui, inhabited by Turks and Greeks, occupies part of its former site. It lies about twenty miles south-east of the large town of Serres, the residence of a bey, and fifty-four miles north-east of Salonichi. M. Cousinéry, formerly French consul at Salonichi, gives an account of the ruins of Amphipolis, which he repeatedly visited, and a view of the site of the antient town, and the course of the river, &c., in his *Voyage dans la Macédoine*. He found some traces of the town wall, some remains of sculpture, and a curious Greek inscription, being a decree of banishment against two citizens of Amphipolis, one of whom, Stratocles, is perhaps the envoy of that name mentioned by Demosthenes in the first Olynthiac, who became obnoxious to Philip for his attachment to Athens. A number of medals are still found among the ruins of Amphipolis. M. Cousinéry visited also the ruins of Eion, formerly a town near Amphipolis, on the left bank and at the mouth of the Strymon. The great Roman road, called the Via Egnatia, ran through Amphipolis, or perhaps rather through Eion.

AMPHIPROSTYLE. This is an architectural term, compounded of three Greek words. It is used to designate structures having the form of an antient Greek or Roman parallelogramic temple, with a prostyle or portico on each of its ends or fronts, but with no columns on its sides or flanks. The plan of the temple of Jupiter Panhellenius, at Ægina, given with the article ÆGINA, will exactly exemplify this arrangement, if the flanking rows of columns forming the lateral ambulatories are supposed to be removed. This would leave (independently of the internal hypæthral disposition in the particular instance) an exact representation of what is intended, in its ordinary acceptation, by the term Amphiprostyle, or, to retain the Greek form, Amphiprostylos; and the structure, having thus four columns in front, would be an *amphi-tetra-prostylon*. (See also PROSTYLE.)

AMPHISBÆNA, (from ἀμφίσβαινα, which signifies, an animal that can walk in both directions,) in zoology a genus of serpents, distinguished by their bodies having nearly the same uniform thickness from the head to the extremity of the tail, by their small mouths and extremely diminutive eyes, their remarkably short tails, and the numerous rings of small square scales which completely surround this organ and the body. A range of small pores runs in front of the vent, which is situated nearly at the end of the tail; the jaws alone are provided with a single row of small conical teeth, the palate being without any; and even those of the jaws are few and distant from one another. They are, moreover, destitute of fangs, and are consequently harmless and inoffensive, living for the most part upon ants and other small insects, and inhabiting ant-hills and burrows which they themselves construct under ground. The nature of their food does not require these animals to possess the power of dilating the mouth and gullet to the extraordinary extent that is observed in the boas, pythons, and other serpents in general, which live for the most part upon animals proportionally much larger than themselves, and in order to admit the huge mouthful have the upper and under jaws both equally moveable upon the cranium. In the amphisbæna, on the contrary, the upper jaw is fixed to the skull and intermaxillary bones, as in birds and mammals, so that the head remains constantly in the same plane with the body,—a form which permits the animal to move equally well in either direction, namely, either backwards or forwards, and which has acquired for it the name by which it is distinguished.

The head of the amphisbæna is so small, and the tail so thick and short, that it is difficult at first sight to distinguish one from the other, and this circumstance, united to the animal's habit of proceeding either backwards or forwards as the occasion may require, has given rise to the popular belief very generally spread throughout Brazil and other parts of South America, the native countries of this genus, that it possesses two heads, one at each extremity, and that it is impossible to destroy the animal by simple cutting, as the two heads mutually seek one another in case of such a serious accident, and soon re-unite as if nothing had happened. Ignorance is the parent of superstition and absurdity, and one wonder naturally produces twenty: it is not therefore surprising that, among an ignorant and credulous people, the singularity of the amphisbæna's form and habits should have given rise to this and a multitude of other gross fictions. 'Another snake,' says Stedman, in his History of Surinam, 'which I also observed here, is about three feet long, and annulated with different colours; it is called amphisbæna, from the supposition of its having two heads; and the truth is, that from its cylindrical form the head and tail so much resemble each other that the error is almost pardonable; besides which, the eyes are nearly imperceptible. This is the snake which, being supposed blind, and vulgarly said to be fed by the large ants already described, is in this country honoured with the name of King of the Emmets. The flesh of the amphisbæna, dried and reduced to a fine powder, is confidently administered as a sovereign and infallible remedy in all cases of dislocation and broken bones; it being very naturally inferred that an animal which has the power of healing an entire amputation in its own case, should at least be able to cure a simple fracture in the case of another. Two centuries have scarcely passed since opinions equally credulous and absurd were universally prevalent among the most enlightened nations of Europe, when grave and learned physicians administered the bezoar or rhinoceros' horn with as much confidence as the simple Brazilian at present does the powdered flesh of the amphisbæna.

The genus amphisbæna, as at present defined, contains only American species, which are confined to Brazil, Surinam, and other tropical parts of the continent. Of these the following are the principal.

1. The *A. fuliginosa*, the first, and still the best known species of the whole genus, is, like all the other amphisbænas, confined to the hotter regions of South America, and does not inhabit Ceylon or any other part of the East Indies, as Linnæus and Lacepède have erroneously supposed, and asserted on the authority of Seba. The general colour of this serpent is a deep brown varied with shades of white, more or less intense according to the difference of the individual and the season of casting the old and acquiring the new external skin. It grows to the length of eighteen inches or two feet, of which, however, the tail measures only an inch or fifteen lines. The body is surrounded by upwards of two hundred rings, and the tail by twenty-five or thirty; the eyes are covered and almost concealed by a membrane, which, added to their naturally diminutive size, has given rise to the popular opinion that the animal was entirely deprived of sight; an opinion extended with no better reason to the common blind-worm (*Anguis fragilis*). It lives upon worms and insects, particularly ants, in the mounds of which it usually conceals itself. The antipathy which most people entertain against serpents in general has given rise to a belief common among travellers, that this species is venomous, but without the slightest foundation in reality, as it is entirely destitute of fangs, and its teeth in other respects so small as to be incapable of inflicting a wound.

[Amphisbæna fuliginosa.]

2. *A. alba*, so called from its colour, which is that of uniform pale straw without any marks or spots. The head of this species is short and thick, and its mouth small. The body usually measures from one foot six to one foot nine or ten inches, and is surrounded by two hundred and twenty-three rings; the tail is from an inch and a half to two inches in length, and is surrounded by sixteen or eighteen rings. The thickness of the body seldom exceeds that of a man's fore-finger, and is uniform throughout its whole length; that of the former species, on the contrary, equals the thickness of a child's wrist of ten or twelve years old. The *A. alba* inhabits the same localities and lives in the same manner as the *A. fuliginosa*, from which indeed it differs only in size, colour, the proportionate length of the tail and body, and in having the mouth provided with a greater number of teeth, all, however, equally small and weak.

3. *A. cæca*, a species mentioned by Baron Cuvier in the second edition of the *Règne Animal*, but without any detailed description. It inhabits the island of Martinique, and is said to be entirely deprived of sight, at least M. Cuvier was unable to discern any trace of eyes. He supposes it, nevertheless, to be identical with the *Amphisbæna vermicularis* of Spix, which that naturalist describes as having eyes scarcely perceptible.

The works of Prince Maximilian of Neuwied and M. Spix on the general zoology and erpetology of Brazil contain descriptions of three or four smaller species of amphisbænas.

AMPHI'SCII, literally *double shadowed*, a Greek term applied by antient astronomers to the inhabitants of the torrid zone, with whom the sun passes the meridian at noon, sometimes on the north, sometimes on the south, of the zenith, and whose shadows at noon are therefore turned to the south during one part of the year, and to the north during the remainder.

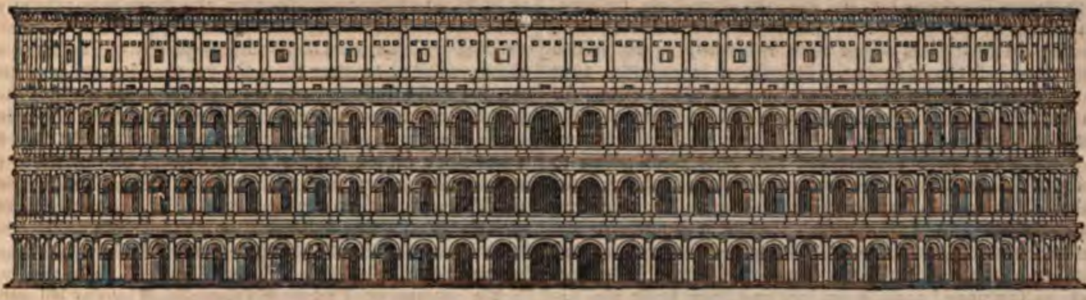
AMPHITHE'ATRE, the name by which a species of structure much used by the Romans, and combining the forms and some of the uses of the antient theatre and circus, is generally distinguished; indeed most of the Roman classical writers apply to it the name of circus also. A distinction, however, is now always made; the term amphitheatre being applied to the species of structure here referred to, and circus being restricted to the Roman stadium or hippodrome. [See CIRCUS.]

[Amphitheatre of Verona.]

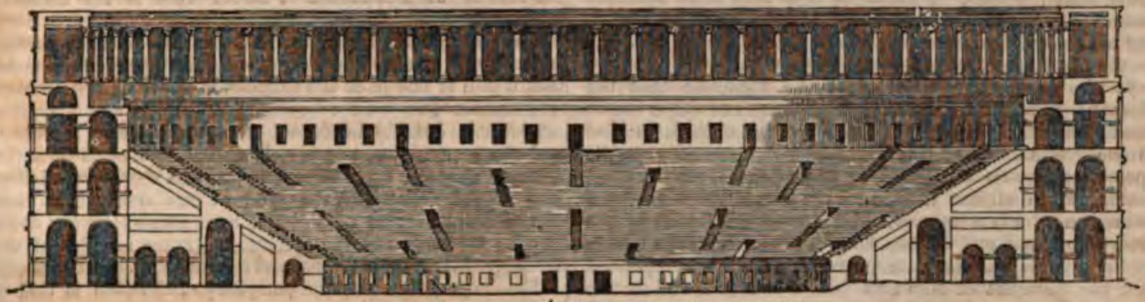
The name amphitheatre seems intended to convey the idea of a double theatre; but what is termed a theatre is, with reference to its original uses, more strictly an odeum, and what we call an amphitheatre was truly a theatre. The one was for hearing music and recitations, and the other for seeing sights,—as the words import. [See THEATRE.]

The form of the amphitheatre is, on the plan, that of an ellipsis, with a series of arcaded concentric walls, separating corridors which have constructions with staircases and radiating passages between them. It encloses an open space called the arena, either on, or a very little above or below the level of the surface of the ground on which the structure is raised. From the innermost concentric wall,—which bounds the arena, and which will be from ten to fifteen feet above its level,—an inclined plane runs upwards and outwards over the intermediate wall, staircases, and corridors, to a gallery or galleries over the outermost corridors. The inner and upper part of the inclined plane is covered with a graduated series of benches following the general form of the plan; these are intercepted at intervals by radial passages leading by a more easy graduation to and from the staircases which pass through the substructions of the benches to the corridors. These corridors, in the principal stories, continue uninterruptedly all round the edifice, and afford easy access to, and egress from, every part. In cases where the radiating passages through the bank of benches were few, concentric platforms or precinctions went round to make the communications complete. The external elevation of an amphitheatre is almost dictated by its internal arrangement and construction, and it generally falls into two or more stories of open arches, which are necessary to give light and air to the corridors and staircases.

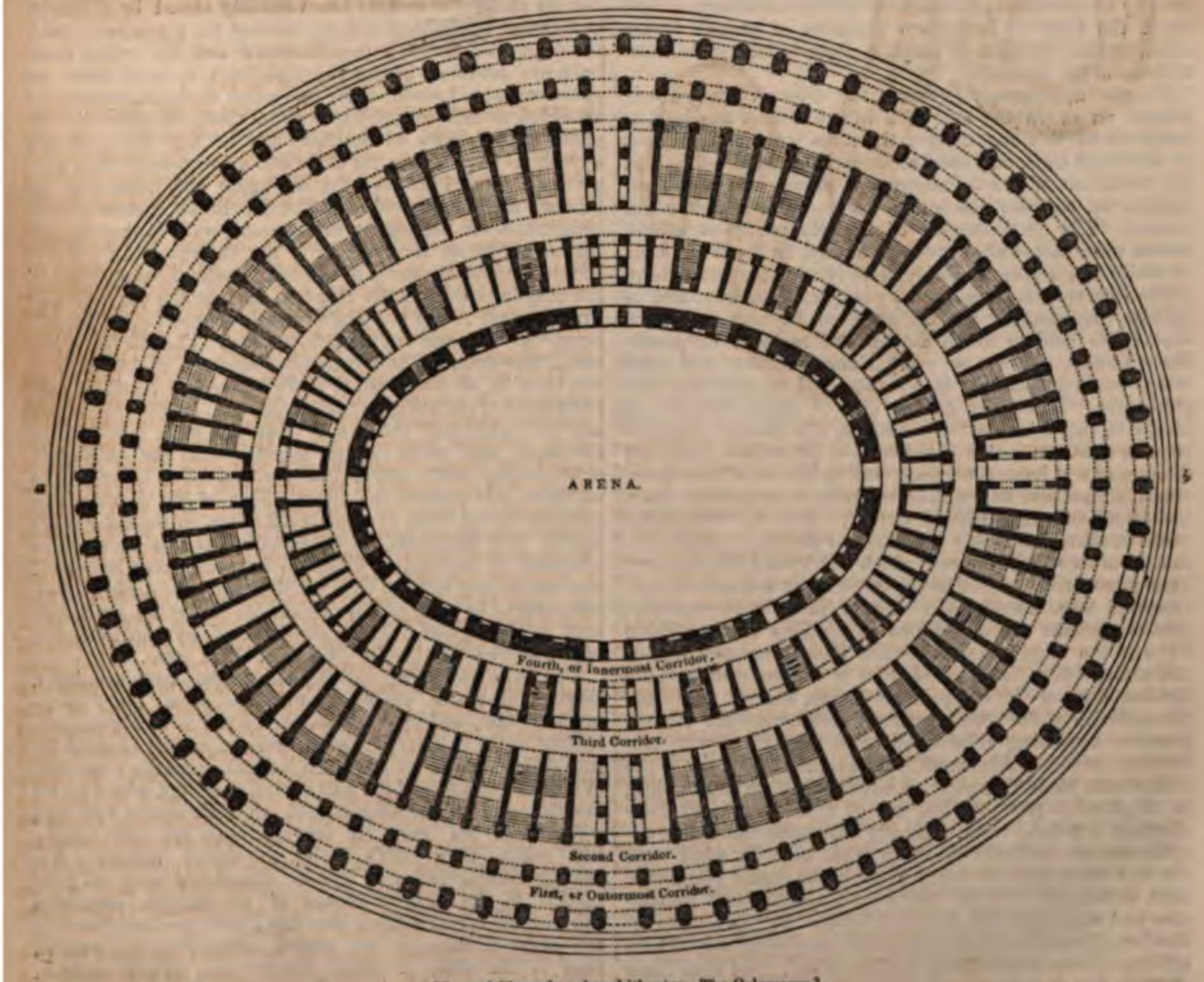
The Amphitheatre seems to have been contrived for the more convenient exhibition of such shows as were confined



[Longitudinal Elevation of the Flavian Amphitheatre, or Colosseum, Rome.



[Longitudinal Section—on the line from *a* to *b* of the plan of an Amphitheatre—The Colosseum.]



[Ground Plan of an Amphitheatre—The Colosseum.]

throughout to the same place, such as combats, which could not be seen advantageously along the length of the circus; and moreover the circus had not the lofty stereobate, podium, or cincture, to protect the spectators from the savage and powerful brute animals which were frequently used in the public shows of the Romans. Indeed, it is reported that this defect was a cause of the abandonment of the circus for such exhibitions as required the use of wild beasts. The great length also of the circus would be a sufficient reason for adopting the more compressed and lofty form given to the amphitheatre, whose arrangement admits of a far greater number of persons being brought within a smaller area, and consequently within more convenient view of the arena.

At first, and for some time, amphitheatres were constructed of timber. Several accidents occurred, indeed, in consequence of the use of such, from fire, and from their incapacity to bear the weights they were subjected to; and, in one instance, it is related by Tacitus, (*Annal.* iv. 62,) that an amphitheatre of this kind fell during the exhibition of the shows, in the town of Fidena, when 50,000 persons were either killed or hurt. Afterwards they were more securely and more permanently constructed of brick or stone, according to the facilities the place afforded, or the means of the people at whose expense the structures were laid.

It was in the latest period of the Republic that the Romans were debased by the gladiatorial and other shows which led to the use and construction of amphitheatres; and to the gratification of this passion for demoralizing public spectacles may be attributed, in some degree, its eventual overthrow, in all but form, and the establishment of the despotism of the emperors. All the powerful men in the state who aimed still higher, sought favour with the people by these barbarous entertainments; and the sums expended and the numbers of men and beasts engaged, and for the most part destroyed, in furnishing them seem almost incredible.

The difference in the national characteristics of the Greeks and Romans is by nothing more forcibly illustrated than by the constant indications of theatres or odeums which mark the sites or immediate vicinities of antient Greek cities, and the remains of amphitheatres which are common to those of the Romans.

To save unnecessary expense, the Grecian theatre was formed on or in the side of a hill, whenever the locality would afford this advantage; the seats were generally cut in the living rock, and such constructions added before it in the formation of the orchestra and proscenium and their accessories, as were absolutely necessary to complete the theatre. The amphitheatre of the Romans was raised, for the most part, within the town or city, on the level plain, of costly magnificence, and generally of enormous extent, while their theatres are in every respect secondary, and of inferior importance. Indeed, theatres for music and the drama are seldom found among the remains of purely Roman cities, but almost every Roman colony, and even camp, bears indications of a constructed or excavated amphitheatre. The great mother city of Rome herself can hardly be said to exhibit the remains of a theatre, unless it be that which is called the theatre of Marcellus; and even this appears to have been more used for games of the circus, or amphitheatrical shows, than for dramatic representations, and is not of extraordinary extent. But the Colosseum would contain from eighty to a hundred thousand persons;—and the little city of Pompeii, which has indeed two theatres, has, moreover, an amphitheatre, whose arena alone would contain them both. The Grecian cities of Sicily, on the contrary, exhibit remains and indications of spacious theatres where those of the amphitheatres of their Roman masters are few and unimportant; and the old cities of Greece itself, and the Grecian cities of Asia Minor, are almost entirely free from the pollution of the latter species of structure,—the Roman garrisons appearing to have contented themselves with castrensian or camp-built amphitheatres alone. Of this sort,—the Castrensian amphitheatre,—we have indications still existing in England;—the principal are at Cirencester and Dorchester; but these were originally little more than mere excavations, or turf-built cinctures made up with what walling was absolutely necessary to form the grand concentric bank of benches. In the provinces of Gaul,—both transalpine and cisalpine,—Nismes and Verona, by the remains of their amphitheatres, show how much more completely the inhabitants were nationalized, or Romanized, than were those of Greece or of Britain.

There is, perhaps, no species of structure peculiar to the Romans, with the details of which we are so well informed, as of those of the amphitheatre, and there is hardly any one of which we have fewer descriptions by antient writers. The remains which still exist in various places tell us much more plainly what they were than the most elaborate descriptions can do; and although there is no example of an amphitheatre in complete preservation, or even nearly so, yet the existing specimens preserve the various parts so completely, that there is but little difficulty in supplying from one of them what is defective in another. Still there are minor particulars of which we must remain ignorant, unless we take them from such descriptions as exist, or supply them from analogy. We know of no sort of antient edifice, generally, in which so much ingenuity is displayed in the arrangement, or so much skill in the construction, as were exemplified by the Romans in the design and execution of the amphitheatre; but here the merit ends,—for in architectural demerit, the external composition of the amphitheatre is hardly outdone by the triumphal arch, which is the worst that ever was imagined before the *revival*, as it is called, of architecture in the fifteenth century.

As the most remarkable, and one of the most perfect in its details, of the remaining examples of the amphitheatre, that which is known as the Colosseum at Rome is here used to illustrate this kind of edifice; the plan and elevation are almost entirely made out from the existing remains; and the section also, to a certain extent, as well as from the analogy afforded by other examples and from probability. The vignette sketch at the head of this article is a view of the amphitheatre of Verona, as it exists, looking down into it; this will aid the section in giving an idea of the arrangement of the benches, and the mode of access to them.

The form of the external periphery of the plan is that of an ellipsis, whose conjugate diameter, or minor axis, is to the transverse, or major axis, as five to six, nearly,—the length through, from outside to outside of the external wall, being 620 feet, and the breadth to the same extent, 513 feet; but as these dimensions are variously stated by different authorities, something may be allowed for inaccuracy, and the proportion between one diameter and the other may be fairly assumed in the original draft to have been as above stated. Indeed, if the projection of the substructions be added to each diametrical length, that proportion will be produced as nearly as possible, and in this the architect appears to have erred; for if he had any reason for the proportion assumed between the conjugate and transverse, or between the breadth and length of the ellipsis, it should have been taken on the extent of the outer wall, so that its periphery might be true, which is not the case. Of course, in the diminishing series of concentric walls the proportion of the ellipsis is continually altering, so that the diameters of the arena are as five to eight, as nearly as may be, the length being 287 feet, and the breadth 180 feet. The difference between the external and internal diameters, of 333 feet, or 166 ft. 6 in. at each end, is occupied by four corridors and two blocks of radiating substructions,—in, or between, which are the staircases and ways from the outer corridors to the inner, and to the arena, together with the concentric or encircling walls which gird the structure, separate the corridors, and enclose the arena. Two of the surrounding corridors lie together, or adjoin each other, on the outer side; and in this particular, the Colosseum exceeds every other structure of the kind of which we have any knowledge, all the rest having but one only; it thus acquires a second gallery, as may be perceived by referring to the section, in which, also, it is singular. The space covered by this immense edifice will be found to be little short of six acres.

The outer encircling wall is pierced with eighty openings, leaving, of course, an equal number of piers; every opening is arched, and in or against every pier is a column projecting about half its diameter, and supporting an entablature which runs in an unbroken line all round the structure. With the exception of the four central openings, which lie on the diameters of the ellipsis, and are each nearly two feet wider than the rest, all the openings are very nearly the same, their width being 14 feet 6 inches. An exactly similar series of arches, diminished only in proportion to the smaller extent of the ellipsis, separates the second corridor from the first; and another, bearing the same relation to the second series that the second does to the first, or outer, bounds the second corridor. The inner faces of the outer piers, both faces of the piers of the intermediate series, and the outer faces of the piers of the innermost series, have pilasters projecting from them, corresponding in height with the external columnar ordinance, and bearing a moulded architrave from the top of which semicircular arches are turned over the corridors and continued all round the edifice. The accompanying plan and section exhibit the general arrangement of the corridors here described, though the details cannot, on so small a scale, be made obvious. The elevation shows how a second and third columnar ordinance, with corresponding and nearly similar arched intervals, superimpose the lowest, and each other, and that each of these two upper ordinances rests upon a continued stylobate or dado, which is broken into every interval, or under every column. The section indicates the repetition of the double series of outer corridors in every story, or behind every one of the three columnar ordinances, and above the outermost corridor in the third story, a mezzanine, or small middle story, for a corridor behind the first, and under the second, or upper, gallery. The same diagrams show that the third story of columns is superimposed by a pilastraded ordinance on a continued and recessed dado also, with a deep plinth they show, moreover, that a bold and massive entablature crowns the whole elevation, and runs its cornice round in one unbroken line.

From the third series of eighty piers, on the ground story, as many walls, with the exceptions to be noticed, run inwards to the third concentric corridor, which is arched over as the outer ones are; the walls are continued on the other side of it to the fourth or innermost corridor, which is bounded on the other side by the massive wall of the podium encircling the arena, and is also arched over, though it is not so lofty as the other three corridors are. Between the radiating walls of the two blocks separating the second from the third, and the third from the fourth corridors, are, of course, as many intervals. Some of these form the traversing passages; and the rest, in the outer block, contain the staircases which lead to the upper concentric corridors and so onward to the upper benches and galleries;—in the inner block are those which lead to the lower benches, and small staircases in the thickness of the innermost wall conduct to the benches immediately on the podium. The benches extend in one long graduated and concentric series from the podium up to the level of the second story of the outer corridors, and over all the constructions within the second of them: they are bounded above by a wall which is pierced with doors. These give access from the upper and inner corridor, to the radiating flights of steps which intercept the benches at intervals, and cut them up into wedges, by which name in Latin, *cunei*, the divisions thus made were distinguished. This encircling wall has windows in it also, which may have been requisite to aid in ventilating the immense area; or they may have been intended merely to afford a view of the arena to persons who could not find room on the benches. The section shows that the radiating flights of steps intercepting the benches do not run through their whole extent, but are themselves intercepted and taken up again,—other lines or flights commencing intermediately, and at intermediate heights. Access is given to these flights at their upper ends, by doorways from the corridors behind, sometimes directly, and sometimes by means of the internal staircases; and in most cases a short reversed flight of steps is made on the outside of the doorways, or vomitories, as they are termed, to afford headway, and avoid intercepting the benches further back than could be possibly helped. Almost every thing that appears in the section above the level of the third story, except the external wall itself, is restored from analogy and conjecture. The peristyle, or encircling range of columns before the upper gallery, is entirely from conjecture; but for the galleries themselves there is sufficient evidence in the existing indications of stairs, and in the toothings of the remaining walls and piers. The benches in the grand series were probably of stone, perhaps of marble, but in the galleries it is most likely they were of wood, and graduated so as to give their occupiers a view of the arena.

The most distinguished seats were those on the podium, and these were assigned to the emperor,—whose place was, by way of eminence, called the *suggestum*,—and to the senators, to foreign ambassadors, and to the great officers of the state. The *cunei*, or wedges, behind and above, were assigned to different classes, according to their rank, station, and tribe. The Vestal virgins had one of the best positions assigned to them, and with them sat such ladies of high rank as could obtain the advantage, but the women generally occupied the galleries.

As the plan indicates, the four central entrances,—those which lie on the ends of the diameters of the ellipsis,—are wider than the corresponding parts of the rest of the structure. They were arcaded through, and finished more carefully, especially those leading from the sides, or on the minor axis; these, it is most likely, were reserved for those persons who went to the seats on the podium, and as they gave access also to the arena, they would of necessity be more strictly guarded.

It does not appear that any part of the structure above the level of the ground, and outside of the arena, was appropriated as dens for the beasts which were used in the shows; for indeed, the corridor leading to the principal seats in the amphitheatre must have been traversed by them in their way to the arena, if that were the case. Substructions were discovered and excavated a few years ago over the whole extent of the arena; these lead to a belief that it was floored with wood, so that the animals required for the day may have been kept in dens under the floor, and allowed to issue at traps in it. But some have supposed dens ranged all round the arena, within its surface and below the podium, from which the beasts would issue to the combat directly.

In the Colosseum the great crowning cornice of the external elevation is pierced through at regular intervals with square holes or mortises, from which grooves are cut down through the rest of the entablature flush with the outer surface of the wall; and every mortise and groove is immediately above a strong projecting stone or corbel at about two thirds the height of the pilastraded ordinance. These are supposed to have been used to insert and receive poles to carry an awning strained over the whole enclosure to protect the spectators from the sun and from rain. If this were the case, there must have been some intermediate support for it of which we are not aware; such an extent of cloth or canvass could hardly have been borne in that manner.

The external elevation is composed,—as it has been already described, and as the elevation indicates,—of three series or stories of attached or engaged columns with their usual accessories, and a pilastraded ordinance, forming a species of attic, which is pierced with windows,—one in every other interspace. The lowest ordinance of columns rests on the upper step of the substructions, or on the ground floor of the structure; it is of what is termed the Doric style or order, but in the debased Roman manner, and its entablature wants the distinguishing feature of that style, the triglyph,—indeed, it may be more aptly designated by the Vitruvian term Tuscan, since it certainly is not Doric, and may be of the latter. The intervening arches are semicircular; they spring from moulded imposts, and have moulded archivolts on their outer faces. The second ordinance is in the Roman Ionic style, having voluted capitals to the columns; and the third is in the Corinthian or foliated style: these, as before stated, rest upon continued, but broken or recessed, stylobata, but their entablatures are, like the rest, perfectly unbroken throughout, and the arches in the intercolumniations in both, correspond exactly—except in minor details—with those of the lowest or Doric ordinance. The pilasters have foliated capitals also, and are called composite; they rest on deep plinths under which there is a continued and recessed dado superimposing the Corinthian entablature;—this dado is pierced with holes or small windows alternating with those of the ordinance above, to give light to the corridor behind the lower and under the upper gallery on the inside. The crowning entablature is made bold and effective by deep modillion blocks or consoles occupying the whole depth of the frieze.

The style of these architectural decorations is, for the most part, as rude and tasteless as it well can be. The storied columnar ordinances, too, besides being themselves bad in detail, are bad in the composition, or in their collocation with arches; for—taking them separately—the columns of each ordinance are too far apart to support their entablature sufficiently, which, therefore, itself appears weak, and they look straggling and inefficient. Taken together, the ordinances but repeat these faults, and have in the whole a poor and mean effect; the shelf-like cornices of their entablatures cut up, and destroy the simplicity of, the elevation, which no observer would suppose to be, as it is, nearly 160 feet high. The storied series of arches with simple blocking courses alone, and continued unbroken stereobata under each arcaded story, and with the broad and simple attic—without pilasters—but crowned nevertheless by the fine bold entablature, would have been a far nobler composition. The practice here exemplified, nevertheless, which may be fairly termed a vice, seems to have pervaded the architecture of the Romans, for either columnar or pilastraded ordinances, and sometimes, as in this case, both, are found on almost all the examples that remain to us of their amphitheatres. Internally, however, the amphitheatre must have been strikingly grand and impressive; here none of the littlenesses of storied columns appeared, but the long unbroken lines of the podium, and the graduated series of the benches, and the galleries with the encircling peristyle above—when it existed—would have been as beautiful in general effect, as anything architecture ever produced.

There are varieties in the arrangement of the details of the amphitheatre, as other examples show. Intermediate concentric galleries, platforms, or precinctions sometimes intercepted the great bank of graduated benches to serve as passages of communication; and sometimes each staircase communicated directly and exclusively with one vomitory, instead of leading to encircling corridors which communicated generally, and gave access alike to every part of the enclosure.

Next in importance to the Colosseum at Rome, of existing structures of the kind, is the Amphitheatre of Verona. The prefixed vignette will give a tolerable idea of its state of preservation. The great external cincture is entirely gone, with the exception of four arches and their accessories; but the great bank of concentric benches, with the staircases leading to them, and the parts about the arena, remain in a comparatively perfect state. The outer cincture was pierced with seventy-two arches, which number appears in the inner, with the corresponding radiating walls to the traversing passages and staircases,—for this had not a second encircling corridor on the outside of the stairs block as the Colosseum has. The outer dimensions of this structure were 500 feet by 404 feet; the length of its arena is 242 feet, and its breadth or length, on the conjugate, 146 feet; the form, of course, was elliptical.

The amphitheatre at Nismes in Languedoc is large and in comparatively good preservation;—the great external cincture of an amphitheatre remains in a very perfect state at Pola in Istria;—Rome contains the remains of a second amphitheatre called the Castrensian;—there are also considerable remains of an amphitheatre at Capua, and of another at Pozzuoli near Naples. That of Pompeii, it has been already remarked, was an extensive structure,—it was in many respects peculiar, but it is not so well preserved as some other examples which have been more exposed, as it suffered considerably from earthquakes before it was buried. At Pæstum, there are indications of an amphitheatre, though not a large one; at Catania, in Sicily, the upper and outer encircling corridor of an extensive amphitheatre is accessible, considerably under the level of the modern city, buried by the torrents of lava from Mount Ætna. Syracuse and several others of the antient cities of Sicily exhibit remains or indications of small amphitheatres. Indeed, wherever Roman remains are found to any extent, whether at home or abroad, some indication may be almost certainly discovered of the existence at some time of an amphitheatre.

AMPHIUMA, in zoology, a singular genus of batrachian reptiles, first noticed by Dr. Garden in 1771, in a letter to Linnæus. The remarkable and anomalous order of batrachians, to which this genus belongs, are more extensively spread throughout the New World, and exhibit a far greater diversity of organic modification in the western hemisphere, than in all the rest of the earth together. It is here alone that the *menopomæ*, the *amphiumæ*, the *axolotls*, the *menobranchi*, and the *sirens*, are to be found: these singular animals abound in all the lakes and stagnant waters, and astonish the observer equally by the variety as by the novelty of their forms. The most remarkable character of these reptiles is the complete metamorphosis which they undergo in their progress from youth to maturity; a metamorphosis which not only affects their outward form, but entirely changes their systems of circulation and respiration. When first separated from the spawn or egg, they appear in what is called the tadpole form, respiring by means of gills and inhabiting the waters. At this period they have neither legs nor arms, but a long tail compressed sidewise enables them to move about in the manner of fishes. Gradually, however, they acquire legs and feet, and whilst the formation of these members is in progress, the lungs likewise are developed, in some genera entirely replacing the gills, in others continuing to exist and act simultaneously with these organs throughout the remainder of the animal's life.

[Amphiuma tridactylum.]

The external form of the amphiuma is very similar to that of the common eel, but the whole anatomy and physiology of the animal approximates it more nearly to the common water-newt (*Triton marmorata*) than to any other known species. From this creature indeed it differs principally in the extreme length of its body and the diminutive size of its extremities, which rather resemble small tentaculi than actual legs. The only two known species inhabit the stagnant pools and ditches in the neighbourhood of New Orleans, and those in Florida, Georgia, and South Carolina. They bury themselves in the mud at the bottom of the ditches, particularly on the approach of winter, and vast numbers of them are sometimes found in draining and clearing ponds, at the depth of three or four feet from the surface. They are also capable of existing on land, but as their food in all probability exists only in the water, they never voluntarily abandon that element. The two known species, *A. didactyla* and *A. tridactyla*, differ principally in the number of their toes, the one having only two, the other three on each foot.

A'MPHORA, in its ordinary acceptation, means an earthen vessel, used as a measure for liquids both by the Greeks and Romans. It received its name on account of its two ears or handles. The proper form of the Greek word is *Amphoreus*. It is generally two feet, or two feet and a half in height; and the body, which is usually about six inches in diameter ending upwards with a short neck, tapers toward the lower part almost to a point. The Attic amphora contained three Roman urnæ, or seventy-two sextaries, equal to about two gallons, five pints and a half of English wine-measure. The Roman, sometimes called the Italic amphora, contained two urnæ or forty-eight sextaries, about seven gallons, one pint English. Homer mentions amphoræ both of gold and stone; and the Egyptians had them of brass. There are various specimens of earthen amphoræ in the British Museum, in the Elgin and Townley Galleries.

The amphora is still the largest liquid measure used by the Venetians, containing sixteen quarts.

There was another amphora among the Romans, which was a dry-measure, and contained about three bushels.

Earthen amphoræ of the Roman time have been occasionally found in England. Like other domestic vessels of the Romans, they appear to have been sometimes used as funeral urns. Columella says they were used to preserve olives in. When filled with wine, they were usually lined with pitch or some other coating, on account of the porous nature of the material of which they were formed. Amphoræ were placed as urinals in the public streets of Rome till the time of Vespasian.

AMPLITUDE, the angular distance of a celestial body from the east point when it rises, or from the west point when it sets. It depends upon the declination of the star and the latitude of the place, and may be computed from the formula,

$$\text{sin. amplitude} = \frac{\text{sin. declination}}{\text{cos. latitude.}}$$

It must be measured towards the north or south points of the horizon, according as the declination is north or south. For the fixed stars, the amplitude remains the same throughout the year: but for the sun it varies with the declination, being nothing at the equinoxes, and about 3½ points of the compass at the solstices, or more exactly 39° 44′ of amplitude, in the latitude of London; that is, at the summer solstice, it rises between N.E. by E. and N.E., and sets between N.W. by W. and N.W.; and at the winter solstice, it rises between S.E. by E. and S.E., and sets between S.W. by W. and S.W.

The term amplitude was also applied to what is more commonly called the *range* of a gun; that is, the whole horizontal distance which the gun will carry. It is sometimes also used in the integral calculus.

AMPTHILL. [See BEDFORDSHIRE.]

AMPULLA'RIA is used by zoologists as the name of a genus of fresh-water spiral univalve shells, which inhabits the rivers and ponds of India, Africa, and South America. They are of a globular or rather depressed form, are covered with a thick olive or black *Periostraca*, and often banded. Their mouth is ovate, with the lips complete all round, and often slightly thickened or reflexed. The animals are somewhat similar to the common pond snail, (*Paludina*,) but they have the front of the head nicked and furnished with two slight conical horn-like processes, and they have long slender tentacles, with the eyes placed on small pedicels at their outer base; these horns and the tentacles often contract into a spiral form. But the great peculiarity of these animals is, that, unlike all other molluscous animals with comb-like gills, they have a large bag, which opens beneath, placed on the side of the respiratory cavity, which they probably can fill with water; and it is this structure which most likely gives them the power of living for a long time out of water, specimens having been brought from Egypt to Paris alive, by only packing them in a little sawdust. Their operculum is formed of concentric rings with the nucleus nearly in the centre; in the species which come from India, this part is generally shelly, but in those of America and Africa it is always horny. The Indian species lay globular pale green eggs about the size of small peas, which are placed in clusters on sticks and other things in the ditches; the eggs when dry form most beautiful objects. Some of the African species are reversed, or have the whirls of the shell turned from the right to the left, and these have been separated into a genus, under the name of *Lanistes*, on this account. It has been generally supposed by the geologist, that all the species of this genus are purely fresh water, but the large Egyptian species, *A. ovata*, discovered by Olivier in Egypt, lives in lake Mareotis, where the water is salt, therefore there is no proof that some of the fossil species are not marine.

AMPURDAN, a district in Spain in the province of Catalonia, between the river Ter and the town of Rosas. It comprises thirty-two miles in length, and twenty-four in breadth, and is the most fertile part of the province. It produces wheat, barley, Indian corn, and wine. The capital is AMPURIAS.

AMPU'RIAS, a town of Catalonia of some note in antient times, but now sunk into insignificance. It is situated on an elevated spot near the Gulf of Rosas, 42° 7′ N. lat., and about 3° E. long., fifteen miles east of Gerona, and about seventy miles N.E. of Barcelona. At a very antient period, this town was named Emporium, on account of its extensive trade: a Greek colony from Marseilles settled there, perhaps about the year 545 B.C. Ampurias had antiently a square harbour on the east side of the town, very capacious and secure, part of the wall of which is still visible upon a rock washed by the sea. The port has been obstructed by the great quantity of sand carried down by the rivers Fluvia and Ter, which empty themselves into the sea not far from Ampurias. On the western side of the town, ruins of walls and edifices are still seen, and until the last century, medals, coins, and other relics of its former splendour were found. Under the empire, about the second century of our æra, its decline began, and it is now reduced to forty miserable houses inhabited by poor farmers. In the time of the Goths it was still a place of some consideration, and an episcopal see. Ampurias belongs to the district of Gerona. Castellon de Ampurias, a town not far from it, is frequently mistaken for the same city. (See Strabo, book iii. p. 160 Casaub.; Miñano; Masdeu, *España Griega*.)

AMPUTATION, from *amputo*, to cut off; the operation of cutting off a limb from the body. Such is the constitution of the animal body in general, and especially of the more perfectly organized body, that if one part of it be diseased, the whole system suffers, while a general disturbance of the system cannot exist long without producing specific disease in some individual organ. Hence constitutional and local diseases are found to exert a most important influence over each other. Some local diseases are of an incurable nature, and proceed progressively from bad to worse. At first, these diseases may not materially affect the general health, but in their progress they produce so much constitutional disturbance, as to endanger life, and ultimately to destroy it. In this case, life is really endangered and destroyed by the local malady; remove that, provided the removal can be effected before the general health is irreparably impaired, and not only is death averted, but health itself is restored. Hence, in all ages, the necessity and advantage have been obvious enough, of removing a part of the body for the sake of preserving the remainder, and men have always been willing to submit to the loss of a limb in order to save the body, on the ground 'that it is better to live with three limbs than to die with four.'

But although it must always have been clear, that it is a gain to save life even at the cost of a limb, when nothing but the removal of the limb can preserve the body, yet it was not always easy to make the sacrifice. Whoever understands the circulation of the blood, and considers the quantity that is sent, and that must necessarily be sent, to each member of the body for its nourishment, and the magnitude of the blood-vessels that are divided in cutting off a limb, will readily perceive how impossible it must have been to perform the operation of amputation before any certain mode was known of stopping the flow of blood from the wounded blood-vessels. But no such mode of stopping hæmorrhage was known to the antients: consequently, though they daily saw the necessity of performing the operation of amputation, yet they looked upon the operation with terror, and shrunk from the responsibility of undertaking it. And no wonder: when they did venture upon it, the consequences were appalling. They cut through the flesh with a red-hot knife, hoping by this means to prevent a fatal loss of blood. After having performed this operation, they dressed the wound with scalding oil, in order to complete what the burning knife may have left imperfect. But these expedients stopped only for a short time the flow of blood. The whole surface of the wound was converted into an eschar, which for a time stopped the bleeding. But the eschar being dead matter it was at length thrown off by the action of the living parts beneath. The moment this took place, the mouths of the blood-vessels were again opened, hæmorrhage took place just as at first, and the patient perished from loss of blood. The uniformity with which this event took place after amputation performed in this mode, could not but cause the operation to be regarded with dismay. Nevertheless, it is pretty clear, that in the time of Celsus, the surgeons of that age were not without some notion of the true mode of stopping hæmorrhage from wounded blood-vessels, for that writer gives particular directions to take hold of the vessels, to tie them in two places, and then to divide the intermediate portion; certain, however, it is, that this practice was not extended to amputation, because nothing was ever amputated by the antients but a part absolutely mortified or dead; and in a part thus mortified or dead, it is not practicable to secure the blood-vessels by the needle and ligature. The general introduction into surgery, of the method of stopping hæmorrhage by taking up the divided blood-vessel with a needle, and placing a ligature around it, must, therefore, be considered as much a modern improvement, as if no allusion whatever had been made to it by antient writers.

But if a knowledge of the mode of stopping hæmorrhage by tying the blood-vessel, be indispensable to the safety of surgical operations in general, the knowledge of some mode of preventing the loss of blood during the actual performance of an operation is indispensable to the safety of the operation of amputation in particular. So large are the trunks of the main blood-vessels that supply the limbs, and so great is the quantity of blood that flows from them in a short space of time, that loss of life is always the consequence of a want of command over these great vessels. By the invention of the instrument termed the tourniquet, an invention of the seventeenth century, (for an account of the construction and application of which instrument, see

ART. TOURNIQUET,) this command is obtained. By these instruments, then, namely, the tourniquet, and the needle and ligature, modern surgeons have such a perfect command over the blood-vessels, that operations may be performed, in which the largest trunks are divided without the loss scarcely of a single drop of blood. On this account, the mere removal of a limb excites in the modern surgeon no degree of anxiety; the operation of amputation is scarcely ever attended with the slightest hazard; nevertheless, there are circumstances connected with amputation of the greatest possible importance, delicacy, and difficulty, on a clear and correct view of which life depends; to obtain such a view, the most extensive knowlege, and the most accurate discrimination, are requisite; while, to act in conformity with it, a high degree of moral courage is often no less necessary. Perhaps the determination of the exact time at which to amputate is sometimes among the most difficult points of surgery; that is, the determination of the time when the preservation of the limb is no longer possible; and when, therefore, it is right to put an immediate stop to any further exhaustion of the health and strength by the removal of the limb. The discrimination of the cases that absolutely require amputation, in contradistinction to those in which the necessity of amputation may be superseded by skilful surgical treatment; the easiest and safest methods of performing the operation; and the best mode of treating the patient after the operation has been performed, involve considerations of the last importance which are often not without considerable difficulty, but these are considerations purely and exclusively professional, and cannot be treated of in a work like the present. No one, however, can look into the modern books which treat of this subject without being struck with the prodigious advancement which surgery has made in recent times; without being deeply impressed with a sense of the debt of gratitude due to the illustrious men who found surgery a mean, and not infrequently a mischievous art, and who have exalted it into a noble and beneficent science.

AMRITSIR, a very antient town, formerly called Chak, the holy capital of the people called Seiks, or Sikhs, in 31° 33′ N. lat., and 74° 48′ E. long. In Burnes' map of the Indus, the latitude and longitude are somewhat more. It owes its present name to a tank 135 paces square, which was built by the Gooroo Ramdas, who improved the town to such a degree that, for a time, it bore the name of Ramdaspoor. Ramdas died in 1581, and in the course of time the name of Amritsir—the pool of immortality—was transferred from the tank just mentioned to the whole town. This town is without any external walls, its houses are built of bricks and lofty, but the apartments are small and the streets are narrow.

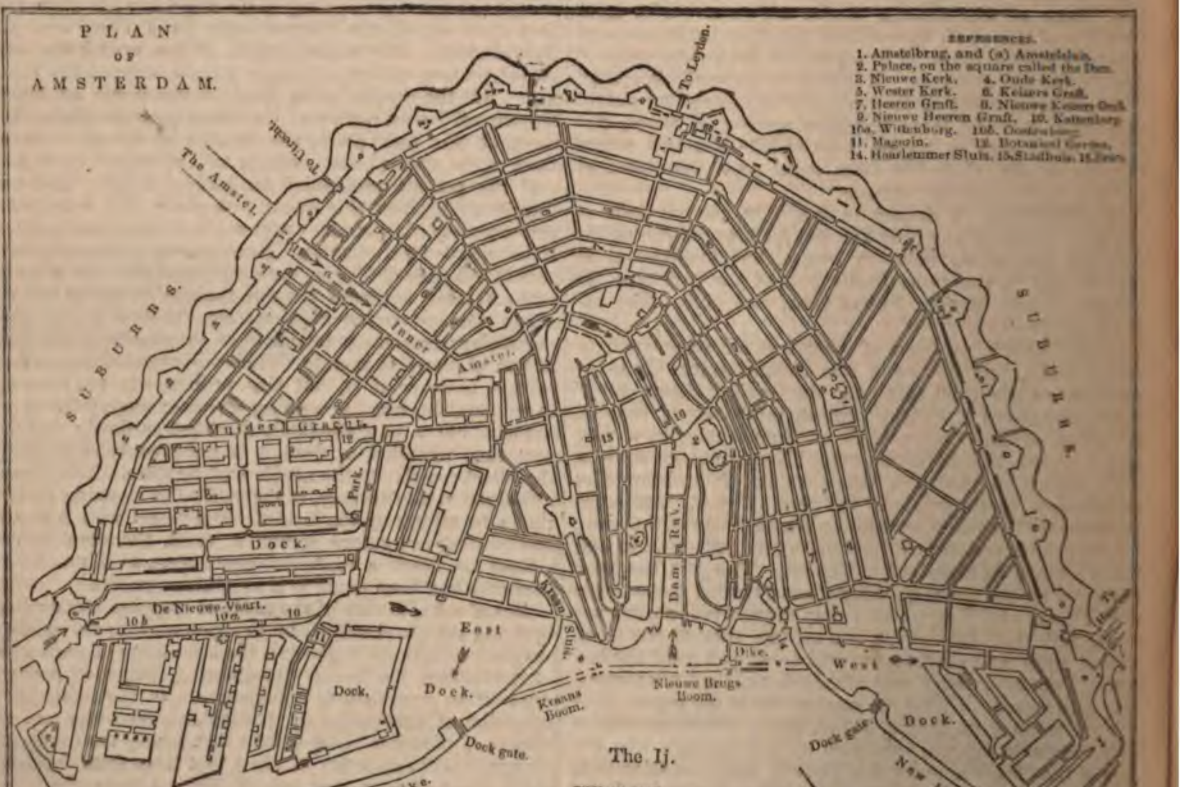
Amritsir has a considerable trade in the shawls and saffron of Cashmere, and is a place of great opulence owing to the resort of merchants and to its being the residence of some bankers of extensive dealings. Its native manufactures are confined to coarse cloths and inferior silk goods. The Rajah Runjeet Singh of Lahore, to whom the district is subject, has lately built a fort here, which he calls Runjeetghur, and he has improved the town by bringing a canal to it from the Ravee, the Hydraotes of Arrian.

The sacred pool has a temple in its centre, which is viewed with a high degree of veneration by the inhabitants, and is dedicated to Govind Singh, who died in 1708, and was the last Gooroo, or religious leader of the Sikhs. A book, containing the code of laws, written by Govind Singh, is deposited in this temple, in the service of which upwards of 500 priests are retained.

Amritsir is about 44 miles east from the city of Lahore, which is on the Ravee, and 1312 miles travelling distance north-west from Calcutta.

(Rennell's *Memoir of a Map of Hindostan*; *Manuscript Documents at the India Board, quoted by* Hamilton; *Report of House of Commons on the affairs of the East India Company*, August, 1832.)

AMSTERDAM, the capital of the province of New Holland, and the commercial capital of the Kingdom of Holland, though not the seat of government, stands on the south bank of the Ij, or Y, a gulf of the Zuider Zee, in 52° 23′ N. lat. and 4° 54′ E. long. The small river Amstel runs into the Y through the city, and gives to it the Latinized name of Amstelodamum, and its old name of Amstelredamme or Amsteldam; the word *dam*, which so often occurs in the names of Dutch towns, means 'a dyke, or embankment of earth to separate two lakes or canals.' The Amstel, for


PLAN OF AMSTERDAM.

miles south of the city, is joined by the Vecht, a branch of the old Rhine which runs past Utrecht. Amsterdam is thirty-two miles north-east of the Hague, and 107 north of Brussels, the capital of Belgium. The city is in the form of a crescent with the two horns projecting into the Y, and forming a kind of port. The Y forms the port of Amsterdam, which was formerly only protected by a double row of piles driven into the ground through the water: the two rows were about seventy feet asunder. About twenty-one openings, called *booms*, were left for ships to pass through, but were carefully closed at night. Large vessels which could not pass through were moored outside in the *laag* or harbour. Between the town and the inner row of piles was the harbour for the small craft. At present two dikes enclose the east and west docks respectively. One begins near the Kraan Sluis and runs eastward, having an entrance called the Dok Sluis; the other commences near the Haarlemmer Sluis and runs westward. (See *Plan of Amsterdam*, 1830, door C. van Baarsel & Zoon.) On the land side it is surrounded by ditches and ramparts, which are now planted, after the Dutch fashion, with trees, and make an agreeable promenade: the Plantaadje (place planted with trees) on the south side of the town is the chief place of resort on Sundays and holidays. The approach to this capital on the land side, especially from Haarlem, is described as very striking; the view extends over spacious meadows, covered with luxuriant grass, to the capital, where the tall masts of ships, spires, and houses are all mingled together; and this scene of activity and wealth is in the midst of a marsh, which seems every moment threatened with inundation from the brimfull canals and waters which surround it. But these form the best defence of Amsterdam, and enable the inhabitants to lay the whole country around under water.

Amsterdam was originally a salt marsh, and in order to make a foundation for houses, it was necessary to drive large piles of wood or rather masts through a layer of peat, which in some places is said to be forty or fifty feet thick. The nature of the soil may differ somewhat in different parts; the following facts will show still better its character. In 1605, a well was dug in one of the hospitals of Amsterdam (Oude Mannen-en vrouwen Gasthuis) to the depth of 232 Dutch feet. After seven feet of earth, there were found nine feet of peat, and then soft clay, sand, earth, clay rather hard, and earth, altogether making fifty-one feet of depth. Then came ten feet of sand, in which stratum the piles of Amsterdam chiefly rest. At the depth of seventy feet there was found one foot of pieces of peat. Sand, through which they did not make their way, was found at the depth of 232 feet. (See *Tooneel der Vereenigde Nederlanden*, &c. *door* Halma und Brouer, Leeuwarden, 1725.)

Such is the substructure of a town which now contains above 200,000 inhabitants. The streets are generally in straight lines along the banks of the canals, which intersect the city; among the finest are the Heeren Graft or Gragt, and the Keizers Gragt, both of which are magnificent streets. Those in the central parts of the town are narrow and without foot-pavement. The private houses are nearly all of brick, painted and ornamented with different colours. The Kalver Straat is filled with shops for jewellery, porcelain, China, books, pictures, and other articles of luxury, and though narrow, this defect is compensated by the rich display of merchandize. Several of the streets are lined with fine rows of elms, walnut trees, and limes. The canals within the town, or *gragten*, as the Dutch call them, are so numerous that the city is divided into ninety islands, which communicate by 290 bridges: the Amstel itself divides the town into the eastern or old, and western or new part, and is crossed by a bridge, the Amstel-Brug, partly built of brick and partly of stone, with thirty-five arches; it is about 610 English feet long, sixty-four and a half wide, and furnished with iron balustrades. Through the eleven central arches large ships pass. Near the bridge is the great sluice, (Amstelsluis,) by which the waters of the river can be either dammed out, or allowed to flow through the city. By shutting the gates the course of the Amstel is stopped, and the country round the city laid under water.

Amsterdam contains thirteen churches for the reformed religion, one English Presbyterian, one English Episcopal, one of the Remonstrants, three Lutheran, two Anabaptist, one of the United Brethren, sixteen Catholic, one Armenian, one Greek, five Jansenist, one Portuguese and one German Synagogue, in all forty-seven places of worship, or one for every 4255 persons. The number of charitable institutions is considerable.

This city has twelve public places, but not one of them is either large or magnificent: the *bogt* (bend) of the Heerengragt is a kind of circus which contains some of the best houses in Amsterdam. In the Dam we see the *Stadhuis*, or old town-hall of Amsterdam, built of Bremen and Bentheim stone, and said to rest on 13,659 piles of wood (Halma): it is 282 feet long, 235 deep, and 116 high, and crowned with a tower. The interior is adorned with a profusion of marble, statues, and pictures, which attest the splendor of the Amsterdam merchant, when he erected this edifice in 1648, during the glorious days of the republic. The marble hall is, perhaps, the finest room in Europe, being 120 feet long, 56 feet broad, and 98 feet high. Louis Buonaparte, who had a great liking for palaces, contrived to get possession of this when he was King of Holland, and the present royal family retain it as a palace. The *Beurs*, or exchange, is a large old building with nothing remarkable, except the concourse of merchants from all countries.

The church of St. Nicholas or the Old Church, (*Oude Kerk*,) is of great antiquity, but its precise date is unknown. In 1578 the Reformed service was first performed in it. The length of the church with the tower is about 278 feet; the tower itself is 221½ feet high: the width of the church at the transepts, measured on the inside, 207¾, and on the outside 192 feet. This church contains the tombs and monuments of many of the great warriors and seamen of Holland: among them is the monument of Admiral Heemskirk.

The New Church (*Nieuwe Kerk*) was originally built, partly on the model of the cathedral of Amiens, but being burnt down in 1645, it was speedily rebuilt, and is, in the opinion of the Dutch, one of the handsomest churches in Europe. Its pulpit is a curious specimen of carving; and the great organ is also much admired. It is 350 feet long, says a Dutch description, 210 wide at the transepts; the upper part rests on 52 pillars of hard stone, and the church is lighted by 75 large windows. It is also conspicuous for its noble and incomparable bronze (or brass?) ornaments of the quire, which consist of six quadrangular fluted columns, and fourteen other small pillars, with two great doors, adorned with two lions holding the arms of the city, and surrounded with well-executed leaf-work: all this, weighing many thousand pounds, rests on a noble marble base. This bronze work, which from top to bottom is 30 feet high, is cleaned twice a-year.

In the high quire of this church is the marble monument of the great Dutch admiral De Ruyter. In another part of this church is erected a monument to the hero Van Speyk.

The Admiralty buildings, the dock-yard, the extensive magazines, on Kattenburg, and even the model-room are accessible to strangers. Near the dock-yard is a marine school, called the *Kweek-School*, or seminary, for the instruction of youths in naval tactics. The warehouses and quays of the East and West India Companies, though they are very considerable, will not excite the wonder of any person who has visited the banks of the Thames.

Among the many literary establishments of Amsterdam we must mention the academy on the Keizergragt, a large and tolerably handsome building, whose title is indicated by the words FELIX MERITIS, in large gilt letters, under the pediment. This academy is divided into five sections, which embrace the various departments of science and learning. There is also an observatory. The *Doctrina et Amicitia* is another learned society, which has a library, museum, and news-room in the Kalver Straat. The botanical garden is not extensive, but contains some old speci mens of Cape plants.

Among the places of amusement are three theatres. Among the prisons, the *Rasphuis*, where the criminals used to saw various foreign woods, and the *Spinhuis* (spinning-house) for females, are best known.

The commerce of Amsterdam was founded by the industry and perseverance of its inhabitants, to which the institution of the bank in 1609 has materially contributed. This is one of the oldest establishments of the kind in Europe, and has always been conducted with the utmost regularity and good faith. Amsterdam is a great depôt both for the commodities of the East and West Indies, with which it carries on a great trade through the Dutch colonies and its own trading companies.

The approach to Amsterdam from the North Sea or

German Ocean is through the passage formed by the Texel and the extreme point of North Holland into the Zuider Zee, the navigation of which is difficult: near the entrance is a bar called the Pampus, over which ships are taken by means of large vessels or boxes, called camels, which being passed under the ship, and then exhausted of their water, buoy the whole up several feet. But since the completion in 1825, of the great **Helder Canal**, (54 English miles long,) Amsterdam has at all seasons a safe and easy communication with the Texel by means of an inland navigation through the whole length of North Holland. By means of its canals Amsterdam has an easy water communication with Utrecht and the Rhine, with Haarlem, the Haag, Leyden, Delft, and Rotterdam. One steam-boat is employed during summer in conveying passengers to Hamburg, and two smaller ones as ferry-boats across the Zuider Zee. Amsterdam has no water that is fit to drink or suitable for culinary purposes, but what is brought in boats from the Vecht, a distance of fifteen miles: the pure water of Utrecht is sold in the streets for table use and for making tea and coffee. The want of so indispensable a necessary must be unfavourable to health, and the stench that arises from the canals in the hot days of summer is sometimes almost intolerable. The fuel of this great city is chiefly turf, which is found in great abundance in most parts of the kingdom. Billets of wood are occasionally used, and coals from Newcastle or the Forth by those who can afford to pay for them. It is remarked that Amsterdam has changed so little for the last century, that the guides and descriptions of this city, published a century ago, may still be considered as correct and useful companions. The origin of Amsterdam is traced to a small fishing place, established on the Amstel, probably during the twelfth century; but the date has not been ascertained by Dutch antiquaries; the name Amsteldam first occurs in a letter of Count Floris, A.D. 1275, in which he exempts the town of Amstelredamme from certain tolls or taxes. In 1482 it was walled, and from 1578, when the states of Zeeland and Holland united with Brabant, Flanders, &c., in the pacification of Ghent, it began to acquire that commercial superiority which Antwerp had hitherto possessed; and of which its various sufferings tended to deprive it. When the Schelde was closed in 1648, the commerce of Amsterdam increased still more at the expence of Antwerp. The area on which the town stands has of course been extended at different periods, but, as far as we can learn, not since 1658.

The chief articles of import are West and East India produce, tobacco, hides, rice, linseed, and grain: the value of imports of the chief articles into Amsterdam by sea was,—in 1829, 2,107,852*l.*; 1830, 1,864,891*l.*; 1831, 1,904,261*l.* The chief exports to Great Britain are cheese, oil-cake, oak-bark, and grain.

In 1827, 1887 ships entered the port of Amsterdam.

The number of vessels that cleared at Amsterdam was, in 1829, 1975: in 1830, 1996: in 1831, 1624. Those to Great Britain were respectively in the three years, 82,114, and 209.

The manufactures of Amsterdam are considerable: the principal are the bleaching of wax and linen cloth, the manufacturing of tobacco, leather, silk, sugar, calico-printing, cotton-spinning, diamond cutting, cannon foundry, and ship-building.

Population of Amsterdam in	1814 .	180,000
	1820 .	195,000
	1829 .	201,000
January 1st,	1830 .	202,364

Of this number, 202,364, there were 90,332 males, and 112,032 females

	Males.	Females.	Total.
Deaths in Amsterdam in 1829 .	4056 .	3942 =	7998
Births „ „ .	3785 .	3618 =	7403

In this year there were 25 deaths of persons above the age of 90, of whom 17 were females.

Büsching states the number of houses in Amsterdam, in 1732, at 26,835, which, we suspect, is more than the present number, and adds that the population was supposed not to exceed 200,000. The burials from 1747 to 1752, a period of six years, averaged 8247 each year.

The lowest ranges of the thermometer noted at Amsterdam are, .

1798 .	30th December .	2 Fahrenheit.
1823 .	21st January .	4 „
1830 .	2d February .	1 „

AMSTERDAM, a small island in the Indian Ocean, discovered in 1697, by Van Vlaming, a Dutch navigator, and situated in 34° 42′ S. lat,, and 76° 51′ E. long.

This island is about four miles and a quarter long from north to south, and two and a quarter from east to west; but so much of its area is occupied by a basin or harbour, that its surface does not contain more than between seven and eight square miles of land. The basin, here mentioned, was formerly a large volcano, into the eastern side of which the sea has forced a passage by the action of its waves, which roll with an uninterrupted current from the east.

The width of the breach thus made is 1000 feet, but the part of the opening through which the tide flows is only one-fifth of that width. The original form of the crater was that of an ellipse, its largest diameter being 3000 feet, and its smallest 2550 feet; it had thus a circumference of nearly a mile and three-quarters, and as its sides rise to the height of 700 feet, at an angle of 65° with the horizon, the brim of the basin has a circuit of rather more than two miles · it must therefore have been one of the largest kind of craters. The depth of water in the centre of the basin is 174 feet, which, added to the height of the sides above the water, gives 874 feet for its entire depth.

The coast in every other part is inaccessible, and exhibits everywhere successive streams of lava. To the north of the entrance of the harbour, and a short distance from it, is an insulated rock, of a pyramidal form, which rises out of the sea to the height of between 200 and 300 feet. This rock is composed of forty or fifty horizontal layers of lava, piled regularly one upon the other. The face of these layers is cracked and divided by perpendicular fissures, many of which are filled with veins of obsidian or volcanic glass, and the same appearance is visible several feet below the surface of the sea. In other of the fissures are some curious specimens of zeolite. Signs of fusion are evident on every part of the surface of this rock, which seen from a short distance has the appearance of scoria from an iron furnace. Obsidian and pumice-stone abound on all the coast.

The slanting sides of the crater contain many thermal springs, some of which run freely, while others ooze out in the form of mud. The temperature of these springs is various, some being 196° of Fahrenheit, and others at the boiling heat; the temperature of the surrounding atmosphere when these temperatures were taken being 62°. Swamps and stagnant pools of water, varying in their heat from 80° to 130°, are found on every part of the island. Most of the springs are brackish; one of them, the temperature of which is 112°, is strongly chalybeate.

The soil is altogether volcanic; it is spongy and porous, and trembles under the feet. If the ear be applied to the surface, a sound like that of bubbling water may be heard.

The sea on the coast abounds with fish. Among these are some red-coloured perch, from six to twelve inches in length; another species of perch from three to four feet long; rock-cod and bream. The quantity of cray-fish seen crawling on the bar, at the entrance of the crater at low water, is almost incredible; and they are so plentiful in the open sea, that if a basket baited with flesh be lowered to some depth for a few minutes, it will be found half filled with cray-fish when drawn up.

No frutescent plant is found on the island. The list of its vegetables is confined to mosses, and other genera of the cryptogamous class, with a few kinds of grasses. Not a single quadruped of any kind inhabits the island, which is likewise free from all insects, with the exception of the common fly. Land birds are never seen here, but the number of aquatic birds which resort hither to lay their eggs is astonishing. Among these are the white and the brown albatross; crested penguin; black, grey, blue, and stormy petrel; puffin; silver bird, or sea-swallow; and a small brown duck, not larger than a thrush.

The shore of Amsterdam island is resorted to by great numbers of seals, for which reason this speck in the ocean, nearly 2000 miles distant from any land, except the little island of St. Paul, is visited by the Americans, who carry the skins which they there procure, to China.

A paper in the twentieth volume of the *Philosophical Transactions*, which gives an account of the discovery of this island by Van Vlaming, states, that the sea was then so crowded by seals and sea-lions, 'that it was necessary to kill them in order to effect a passage for the ship to the shore.' These animals, although still abundant, are certainly not now in sufficient numbers to obstruct the passage. Another marvellous statement in the same paper was to the effect, that fish might be caught in the sea with one hand and cooked with the other, in the natural boiling springs, and this assertion has certainly been corroborated by Mr. Barrow, who, in 1793, dropped some perch 'living, off the hooks into a boiling spring, and found them cooked to perfection in fifteen minutes.'

Amsterdam island is about midway between Australia and Madagascar.—(*Philosophical Transactions*, vol. xx.; Barrow's *Voyage to Cochin China.*)

AMSTERDAM, NEW. [See BERBICE.]

AMU. [See OXUS.]

AMULET, in barbarous Latin, *Amuletum*, or *Amoletum*. Some suppose the word to be of Arabic origin. An amulet hung round the neck, or carried in any other way about the person, is absurdly believed to have the effect of warding off morbid infections and other dangers, and even of curing diseases by which the body has been already attacked. The belief in the efficacy of amulets has subsisted at some time among almost every people, and the thing has been denoted by a great variety of names, which it is unnecessary here to enumerate. The phylacteries, or bits of parchment with passages from the Bible written upon them, which the Jews were wont to carry about with them, were amulets; of just the same character are those inscribed with sentences from the Koran, which the Moorish priests sell to the negroes of Africa, and to which the latter give the name of *Fetishes*. This superstition, which existed also among the Greeks and Romans, appears to have in early times prevailed extensively among the converts to Christianity, if we may judge by the denunciations directed against it by St. Chrysostom, and others of the fathers. But even down to our own day, it has continued to be an article of the popular creed, that certain medical preparations, and other things, merely carried about the person, have the power both of repelling and of healing diseases. Even the celebrated Robert Boyle adopts this notion, assuring us that he once experienced the efficacy of such an amulet in his own case. 'Having been one summer,' he says, 'frequently subject to bleed at the nose, and reduced to employ several remedies to check that distemper; that which I found the most effectual to stanch the blood was some moss of a dead man's skull, (sent for a present out of Ireland, where it is far less rare than in most other countries,) though it did but touch my skin till the herb was a little warmed by it.' (*Essay of the Porousness of Animal Bodies.* See also his *Essays on the Usefulness of Natural Philosophy*, and his *Experimental Discourse on some Unheeded Causes of the Insalubrity and Salubrity of the Air.*) The anodyne necklace, which consists of beads formed from the roots of white bryony, and is sometimes hung around the necks of infants with the view of assisting their teething, is an instance of the still surviving confidence in the medical virtue of amulets. Such also is the belief generally entertained by seafaring people, that a child's caul on board their ship will preserve them from being lost—and many other examples might be easily quoted.

AMUR, one of the largest rivers of Asia. If we except the two largest rivers of Siberia, (Oby and Lena,) and those of China, (Hoang-ho and Yantse-kiang,) only the Yenesei is superior to it in the length of its course. The sources of the Amur are situated near 110°, and its mouth about 143° E. long. The mouth is opposite the northern extremity of the island of Taraikai, formerly called Saghalien, in 53° N. lat.

This river carries off nearly all the waters of the slopes and the mountains in which the great Asiatic desert, Gobi or Shamo, terminates towards the east; and it would be advantageous to geographical science if we were well acquainted with the country which it traverses. But as only a comparatively very small tract of country along its sources belongs to the Russian empire, and all the remainder of its course is subject to the Chinese, who do not admit European travellers into their territories, our knowledge of this part of the globe is very deficient.

The true source of the Amur is the river Onon, which rises near the 110th meridian, in 50° N. lat., in that range of the King-gan Oöla which is called *Kentei-Khan*. This river, which waters a country at present nearly uninhabited, is famous in Mongol history; the great hero, *Tshingis-khan*, was born, and distinguished himself in his youth, on its banks. The Onon first runs from west to east for about 160 miles, and afterwards to the north-east for about 320 miles, till it joins the Ingoda. The latter river rises on the eastern declivity of the Tshokondo, the highest summit of the range, which separates the tributaries of the Amur from those of the lake of Baikal, or of the Yablonoi Krebet; and runs nearly parallel to the Onon till it joins it, after a course of about 160 miles. After this junction the river is called Shilka by the Russians, and Saghalien-Ula by the Mandshoo, and continues under this name its north-eastern course for about 260 miles, when it meets the Argun or Ergunê, a large river, which in its upper course is called Kherlon, and has its sources also in the Kentei-Khan, near the 110th meridian, but about three degrees farther to the south, in 47° N. lat. The Kherlon runs, according to the Chinese geography, in the first part of its course, to the north for about seventy miles, then for about thirty-five miles to the south-east, and afterwards to the north-east for 320 miles. It then changes the direction of its course to the east, making its way through two ranges of high mountains, and after having run in this direction for about a hundred miles, it falls into the large lake of Kulun or Dalai Nor, whose circumference is considered by the Chinese to be about 600 *li*, or nearly 210 miles. From this lake the river issues under the name of Argun, forms the boundary between the Chinese and Russian empire, and, after a north-north-eastern and northern course of about 400 miles, joins the Shilka, in 53° 23′ N. lat.

After this junction the river is called Amur by the Russians, who adopted this name from the Ghileaki, a tribe of the Tunguses, living near its mouth, in whose language Amur or Yamur signifies the great river, or the great water. The Mandshoo preserve the name of Saghalien-Ula (river of Black Water).

The Amur does not long continue its north-eastern course. An extensive mountain-range, the King-gan Yalo, stretching from south to north, obliges the river to take the same direction. But it soon forces its way through the mountains, forming for perhaps a hundred miles a succession of rapids till it enters the plain situated to the east of the mountain-range. The rapids formed in this extensive tract do not seem to render the river unnavigable, though at present it is not used.

During its passage through the mountains, the Amur changes the direction of its course from north to east, declines afterwards to the south-east and south, and continues in this direction till, from the 54th parallel, it has descended to the 48th. It then resumes its eastern course, and at its most southern point, (47½° lat.,) its waters are increased by those of the Sungari or Songari Ula, which by the Chinese is considered as the principal river. The Songari Ula rises nearly under the 42d parallel in a mountain-mass called Tshang-pe Shan, (the White Mountain or Mount Blanc, on account of the snow with which its summit is always covered,) which extends along the northern coast of the Hoang-hai, (Yellow Sea,) and forms the northern boundary of the peninsula of Corea. Its general course lies N.N.W. till it joins the Naun or Nonni Ula, a large river which descends along the eastern side of the King-gan Yalo mountains, from the 52d parallel to the 46th in an opposite direction from north-west to south-east. After this junction the Songari-Ula runs E.N.E. till it joins the Amur.

At a considerable distance from the junction with the Songari Ula, the Amur again changes its course, running henceforth to the N.N.E. up to its embouchure, and traversing the country between the meridians of 125 and 140, and between the parallels of 47 and 53. In this part of its course it receives another considerable river, the Usuri-Ula, which runs parallel to the Pacific Ocean, from which it is divided by a high mountain-range; but this tributary of the Amur is entirely unknown.

The whole course of the Amur, from the sources of the Onon to its mouth, amounts, perhaps, to nearly 2000 miles, owing to the great and frequent changes of its direction; in a straight line, the sources and mouth are only about 1330 miles distant from one another.

As far as this river is known it abounds in fish, but though they are the same species as those of the rivers in Europe, they are, as Pallas observes, distinguished by some peculiarities. The most common are two kinds of carp, (*Cyprinus leptocephalus*, Pall., *Cyprinus labio*, Pall.,) barbels, and a smaller kind of shad-fish (*Silurus asotus*). The beluga, a larger kind of sturgeon, is frequently caught in the Shilka, but the common sturgeon is rare, as well as a kind of trout

(*Salmo oxyrhynchus*). Craw-fish, which are not found in the north of Asia, are very frequent in all the tributaries of the Onon and Shilka, but they are smaller and smoother than those in Europe. The common pike is yellow like gold and spotted like the fish in India: Pallas, at the first view, was inclined to consider them as a distinct species. Pearl-oysters are found in the Onon and some of its tributaries, and the common barnacle in some lakes attains an extraordinary size and thickness. Pallas got some which were upwards of a foot long, and from three to four-tenths of an inch thick.

The country watered by this river and its branches is divided by the King-gan Yalo mountains into two parts, quite different in their character; this mountain range is to be considered as the eastern boundary of the great desert of Gobi or Shamo, and the country to the west of it, about the Onon and Argun, preserves many of the characteristics of the desert. It is considerably elevated above the level of the sea, but as yet the elevation of no part of it has been exactly determined. To this elevation it must chiefly be attributed, that the Shilka and the Argun, both of which are slow rivers, are commonly covered with ice from five to six months in the year, though they flow under the parallels of London and Paris. The air, like that of the great desert, is very dry. Rain in summer and snow in winter are far from being abundant. The greatest part of the soil, perhaps more than nine tenths, is sandy and sterile, and unfit for agricultural purposes, and of the remainder a small portion only is actually cultivated: but in that part of this region which belongs to the Russian empire, and which may amount to nearly one-third, agriculture was much more attended to before the Cossacks conquered it. On their arrival here, in the middle of the seventeenth century, they found very large tracts cultivated with care, but the cruelties and vexations exercised by them obliged a whole nation, the Da-ures, from which this country is called Da-uria, to abandon their native soil and to take refuge within the Chinese empire.

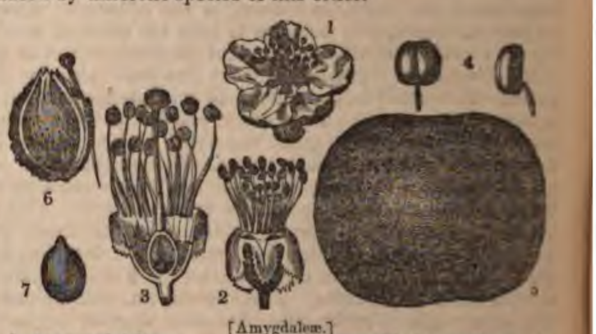
The country to the east of the King-gan Yalo, which belongs altogether to the Chinese empire, exhibits an entirely different appearance. Though the mountains which separate the valleys along the Amur, Songari-Ula, and Na-un-Ula, rise to great height, the valleys seem not to be greatly elevated above the level of the sea. This is indicated by a much milder climate, by the frequency of large forests of oak, lime-trees, and hazel-nut trees, which replace the scanty woods of fir and larch of Da-uria, as well as by the abundance of a kind of cherry-tree. The ground along the river, and even to a certain height on the slopes of the mountains, is cultivated, and produces barley, rye, wheat, buck-wheat, and hemp, and between the fields extend fine meadows. Since the accession of the present dynasty to the throne of China, many persons are banished to these valleys for their crimes or misdemeanors; and this policy, it is said, contributes powerfully to improve the state of agriculture. The valley of the Usuri, however, seems to be more elevated, and is therefore chiefly inhabited by a branch of the Mandshoo, who still follow a pastoral life. The mountains which divide this valley from that of the Songari-Ula produce a plant, which is regarded as a great treasure, the *ginseng*, which in China is considered a panacea; this is the only place where it is found on the old continent. [See GINSENG.]

Not far from the banks of the Shilka, and on those of a small river called the Nertsha, the Russians have built the town of Nertshinsk, which, according to Captain Cochrane, does not contain more than 1000 inhabitants. The principal town in the Chinese territories is Kirin or Girin-Ula on the Songari-Ula, the seat of a provincial government. In the valley of the Na-un-Ula is the town of Naun-Koten, and in that of the Usuri, Ninguta, the native place and patrimony of the Mandshoo dynasty at present reigning in China.

The Russian part of Da-uria has been abandoned by all the native nations, except a small number of Tunguses who still wander about with their herds. In the Chinese territories some aborigines are still found. [See MANDSHOORIA.] (*Travels of* Pallas and Timkowsky; Ritter's *Erdkunde von Asien.*)

AMURATH. [See MURAD.]

AMYGDA'LEÆ, a natural order of plants belonging to the division of polypetalous dicotyledons, among which it is known by its bearing the kind of fruit called a drupe, by the stamens being numerous and arising from the orifice of a tubular calyx, and by the leaves yielding the fluid called prussic acid. Owing to the last circumstance, the species are all more or less poisonous, especially in those parts where the prussic acid is concentrated, as the leaves of the common laurel, the skin of the kernel of the almond, &c. On the other hand, those parts in which the prussic acid exists either in very minute quantity, or not at all, as the succulent fruit, and sometimes the kernel, are harmless, and are often valuable articles of food. It is on this account that, while the general character of the foliage is either unwholesome or suspicious, the fruit of many of them is much cultivated. The peach, the nectarine, the plum, the cherry, the almond, the apricot, prune, damson, and bullace are produced by different species of this order.



[Amygdaleæ.]

1. An expanded flower. 2. The same with the corolla removed. 3. The same cut through. 4. Anthers. 5. Drupe. 6. Stone. 7. Embryo.

Besides the substance already mentioned, the bark of amygdaleæ yields a gum which is similar in its properties to gum arabic; and an astringent substance which gives some of the species so much efficacy in fevers, that their bark has been compared for utility to that of Peru; and even in some cases, as the coccomiglia bark of Calabria, the produce of prunus coccomilia, has been preferred.

AMYGDALOID, the name of a variety of the trap rocks, when in a uniform base there are imbedded round or almond-shaped bodies, consisting of agate, calcareous spar, or zeolites, like almonds in a cake; the term is derived from the Greek ἀμυγδαλο-ειδὴς, *resembling an almond.*

AMY'GDALUS, the genus from which the order derives its name, comprehends the almond, and the peach and nectarine, besides a few bushes, the chief interest of which arises from their gay appearance.

A. communis, the common almond, is a native of Barbary, whence it had not been transferred into Italy in the time of Cato; it has, however, been so long cultivated all over the south of Europe and the temperate parts of Asia as to have become, as it were, naturalized in the whole of the Old World from Madrid to Canton. In this country, it is only grown for the sake of its beautiful vernal flowers; but in the countries that have a long and hot summer, it is the fruit for which it is esteemed. This, which is produced in immense quantities, is partly exported into northern countries, and partly pressed for oil, or consumed for various domestic purposes. Although botanists distinguish only one species of eatable almond, yet there are many varieties, of which the principal are the bitter and the sweet; of each of which the French and Italians have several sub-varieties distinguished by the hardness or softness of their shell, and the form or size of the kernel. These have all been introduced into England, but none of them are capable of ripening their fruit in the neighbourhood of London, except in unusually fine hot summers, preceded by mild and uninterrupted springs.

A. Persica, the peach, once called the Persian apple, because it was introduced from that country into Europe, has, for ages, been an object of careful cultivation for the sake of its delicious fruit, and has almost naturalized itself even in the New World. In our gardens many varieties are known, which are classed under the two heads of peaches and nectarines according as their fruit is smooth or downy: of the varieties there are few that are not worthy of cultivation, but the best are, perhaps, the red magdalen, noblesse, and royal George peaches, and the Smith's Newington, or tawny nectarine. For a late crop of peaches, the têton de Venus may be recommended; but not the Catherine, nor indeed any of the thick-skinned October peaches, which, however excellent in the south of Europe, seldom ripen, and never acquire their natural flavour in this country. For preserving, the blood red, or sanguinole peach, the flesh of which is of the deepest crimson, is worth a place in a garden.

For the mode of cultivating the peach and nectarine, see Peach.

AMYOT, JAQUES, great almoner of France, bishop of Auxerre, commander of the order of the Holy Ghost, rose to these high dignities and to wealth from the humblest rank in life. He was a native of Melun (1514), chief town of the department of *Seine et Marne*, about thirty miles from Paris. His father was a butcher or a currier, it has not been ascertained which, but in very limited circumstances. When he came to Paris to continue his studies, he was obliged to act as servant to some of his fellow students, in order to procure the means of subsistence, the only weekly allowance which he received from his friends being a loaf of bread. After studying under the learned professors of the college of France, which had then been recently founded, and after taking his degree of master of arts, at the early age of nineteen, he went to Bourges to study law; there he distinguished himself so much as to induce the king's lecturer, Jacques Colin, to intrust him with the education of his nephews. Subsequently, through the patronage of Marguerite de Valois, sister of Francis I., Amyot obtained a Greek and Latin chair at the University of Bourges. Whilst he was filling that situation, he undertook a translation of Plutarch's Lives, of which he dedicated the first books to the king, Henri II. The monarch, as a mark of his approbation, gave him the abbey of Bello-sane, and desired him, at the same time, to continue a work so replete with merit. This circumstance gave him an opportunity of displaying talents of another kind; for, under the pretence of going to Italy to consult some manuscripts, he was entrusted with a letter from Henry the Second to the council of Trent, then assembled. Although he was not invested with any public character or authority, he displayed nevertheless much firmness and adroitness in his mission; so great, in fact, was the satisfaction which the Cardinal of Tournon felt on this occasion, that he recommended him to Henry II. as a fit person to be the tutor of his three younger sons. Charles IX., on his coming to the throne of France, made Amyot his great almoner and keeper of the University of Paris; soon after he gave him the vacant see of Auxerre. It is said that, at the death of Charles IX., and on the day his funeral took place at St. Denis, the Parliament of Paris sent for Amyot, that he might say grace for them, acting as king of France. We should here observe that Henri III., the brother and successor of Charles, was yet in Poland; the Parliament might, therefore, suppose themselves to be reigning in his absence: besides, there was then a party who wished to put the crown on the head of the Duc d'Anjou, second brother of the late king Charles, the same who had been on the eve of marrying Elizabeth of England, and to refuse it to the king of Poland. Amyot disobeyed the command, and hid himself. Henri III., on his accession to the throne, continued him in his dignities, and moreover made him commander of the order of the Holy Ghost. Amyot had much to suffer from the league to which he was thought to be an enemy; he was even accused of having been privy to, and having participated in, the assassination of the Duc de Guise, at Blois (December, 1588). So inveterate were the leaguers against him, that they attacked and plundered him some time after as he was returning to Auxerre; nor, indeed, could he appease this hostile spirit until he had obtained a formal absolution from the Pope's nuncio, of the crime of participation of which he was suspected. He was, however, afterwards allowed to finish his days in quietness, in his diocese, where he died in 1593.

As a literary man, Amyot stands high; no one did more service to French letters. His translation of Plutarch's Lives, which was made from the Latin, is spirited and elegant; and it is remarkable that the best translation of Plutarch in English, North's, is made from Amyot's French. His other works consist of French translations of other Greek works, of which the principal are, The Æthiopic History of Heliodorus, seven books of Diodorus, the Pastoral Loves of Daphnis and Chloe, &c. He has, besides, given an Account of his Journey to Trent, in a letter addressed to M. de Morveilliers. He composed a treaty on royal eloquence for the use of his pupil, Henri III., which was printed, for the first time only, in 1805, under the reign of Napoleon. It was at the suggestion of Amyot that Henri III. founded, in 1575, a Greek and Latin library.

Amyot has been accused of avarice; this charge is, however, partly refuted by the fact of his having spent large sums for the repairs and embellishments of the churches of his diocese. He left the sum of 700,000 francs at his death, although he frequently complained of his having been ruined by the league.

AMYRI'DEÆ, a natural order of plants consisting of tropical trees, the leaves, bark, and fruit of which abound in fragrant resin. It is known among polypetalous dicotyledonous orders by its hypogynous stamens, which are twice as numerous as the petals, by the large disk in which the ovarium is inserted, and by its one-seeded, fleshy fruit, covered all over with resinous glands.

The odoriferous substances called gum elemi, bdellium, and resin of Coumia are all produced by different species of amyrideæ.

ANA, a Latin termination of the neuter plural form. It appears in our language, divested of the sign of gender, number, and case, in such words as subterranean, metropolitan, Christian, Anglican, Ciceronian, Johnsonian. The Latin *ana* is the form appropriated to the neuter plural; and, therefore, *Ciceroniana*, for instance, would signify, matters, or things of any sort, about, or appertaining to Cicero.

In modern times this termination has been used to denote collections, either of remarks made by celebrated individuals in conversation, or of extracts from their note books, letters, or even published works, or, generally, of particulars respecting them.

Such collections have been made in all ages, and in every country in which literature has been cultivated. For an enumeration of antient works, still existing or known to have once existed, of a similar character to the modern *ana*, the reader may consult Christopher Wolf's preface to the *Casauboniana*, and the *Introductio in Notitiam Rei Litterariæ* of B. G. Struvius, with the notes of J. C. Fischer, Frankfort, 1754, chap. viii., sections 11, 12, 13, and 14. These writers mention as coming under this description the Proverbs of Solomon, those collections of the sayings of the wise which are to be found in many oriental languages, those which the disciples of Pythagoras and of other antient philosophers are stated to have made of the remarks that fell from their masters, the *Απομνημονεύματα*, or *Memorabilia*, of Socrates recorded by Xenophon, the sayings of Epictetus, said to have been collected by Arrian in the four last books (now lost) of his *Commentary on the Enchiridion*, and in his twelve books of *Homilies*, the *Deipnosophistæ* of Athenæus, the Biographies of Plutarch and Diogenes Laertius, the Facetiæ attributed to Hierocles, the several collections of Stobæus, the *Meditations* of Marcus Antoninus, the books of apophthegms by Cæsar, mentioned in Cicero's *Letters*, the jests and bons mots of Cicero, said to have been collected by his freedman Tyro, the *Natural History* of Pliny, the *Noctes Atticæ* of Aulus Gellius, &c. The catalogue, it must be confessed, is constructed upon sufficiently liberal principles; but a good many of the performances which it comprehends might certainly have been called *Ana* in the modern sense.

A curious approach to an anticipation of the modern use of the word occurs in a letter of Francesco Barbaro to Poggio Bracciolini, in which, alluding to some literary anecdotes which Poggio and his friend Bartolomeo Montepulciano had collected in Germany, and were bringing home with them, he says, that as certain sorts of apples and pears are called *Appiana* and *Malliana* from having been first introduced by persons of the names of Appius and Mallius, so these importations of theirs will be afterwards called Poggiana and Montepolitiana. The letter is dated in 1417. It is given in Lenfant's *Poggiana*, at the end of the second volume, where it was first printed entire. But it does not appear to have been till after the middle of the seventeenth century that the exact modern application of such epithets came into fashion. In 1659 we find Guy Patin, in one of his curious gossipping letters, speaking of having in his possession certain manuscript Borboniana, Grotiana, and Naudæana, meaning collections of anecdotes respecting Nicolas Bourbon (the younger), Grotius, and Gabriel Naudé. Very soon after this appeared the first printed *Ana*.

This was the collection of the colloquial remarks of Joseph Scaliger, now distinguished as the *Scaligerana Secunda*. Two brothers, Jean and Nicholas de Vassan, the sons of a M. Vassan, Sieur de Remi-Mesnil, and whose mother was a sister of the eminent scholars Peter and Francis

Pithou, having gone to study at Leyden, carried with them letters of recommendation from Casaubon to Scaliger, who was then one of the professors in that university. In consequence they were much at his house, and heard a great deal of his conversation, both in company and in private. Such of his observations upon all sorts of subjects as they considered to be most valuable or remarkable they wrote down, till the collection at last formed a thick octavo volume. On their return to France they gave their manuscript to the learned brothers Claude, Pierre, and Jacques Du Puy; and the latter lent it to M. Sarran, who took a copy of it, which came into the possession of his son, Isaac Sarran. From him it passed into the hands of Hadrian Daillé, a French protestant clergyman, and a man of letters, who gave the book a new form by arranging the remarks according to the alphabetical order of their subjects. From Daillé Isaac Vossius, in the course of a visit which he made to Paris, procured the manuscript, but, as it appears, without any notion on the part of the lender that he would make any other than a private use of it. Having, however, got it home with him to Holland, he transcribed it, and some time after sent his copy to the press. The book was published in 1666, with the title of *Scaligeriana, sive Excerpta ex ore Josephi Scaligeri:* per FF. PP., (contraction for *Fratres Puteanos.*) This impression, however, so abounded in inaccuracies, that Daillé, notwithstanding his regret that the publication had taken place at all, felt himself called upon to give to the world a new and more correct edition, which appeared accordingly the following year, with the title of *Scaligerana; editio altera, ad verum exemplar restituta, et innumeris iisque fœdissimis mendis, quibus prior illa passim scatebat, diligentissime purgata.* There is some uncertainty as to where these volumes were published. That of Vossius (which, however, does not bear his name) is a 16mo. volume of 368 pages, in rather a large type, and, in the only copies which we have seen, is stated to have been printed at Geneva, by Peter Columesius. All the accounts also, as far as we know, state that it bore this impress, though actually printed by Vlacq, at the Hague. But it is certain that Daillé, in the advertisement prefixed to his own edition, speaks of it as actually announcing itself on its title-page to have been published at the Hague; 'Hagæ-comitum (si titulus vera fert)' are his words. Daillé's edition, again, which is a 12mo. of 268 pages, but in so much smaller a type as to contain a good deal more matter than the other, professes to be printed at Cologne, by Gerbrandus Scagen. But it is said to have been really printed at Rouen. It is very incorrectly printed, and has a long list of errata prefixed; but, besides being considerably more full, it is purified from many gross blunders, which make the edition published by Vossius frequently unintelligible. In his prefatory address (to which however he does not put his name), Daillé complains in indignant terms of the publication at the Hague, which he says had taken place not only without the consent of those to whom the manuscript belonged, but in opposition to their most strenuous remonstrances and menaces. He also corrects the title, which, in the original, he says, is Scaligerana, not Scaligeriana. The word *excerpta* he thinks must be a printer's blunder for *excepta.* He likewise gives the true history of the manuscript, and refutes the assertion of the Hague edition, that its contents had been taken down from the lips of Scaliger by the Du Puys. It would appear, however, that Vossius, or his publisher, paid no attention to any of these corrections; for a new impression, in all respects the same with the first, was published by Vlacq at the Hague, in 1668. Some of the copies of this edition bear the impress of Leyden; but they are said to differ in nothing else from the others.

It happened, however, that the Vassans were not the only persons by whom Scaliger's conversations had been noted down. Before they knew him, and, indeed, while he lived in Touraine, and before he went to Leyden, a physician of the name of François Vertunien, who attended the family of the MM. Chateigners de la Rochepozai, in whose house Scaliger resided, had been in the habit for seventeen years, namely from 1575 to 1592, of keeping a record of the remarks that dropt from the lips of the great scholar. Vertunien's papers remained for a long time after his death almost unknown, till they were at length purchased from a person into whose hands they had fallen by M. de Sigogne, an advocate of the parliament of Poitiers. By him they were committed for publication to the care of Tanneguy le Févre, (better known by his Latinized name of Tanaquillus Faber;) and they accordingly appeared along with the former in 1669, bearing the following title, *Prima Scaligerana, nusquam antehac edita, cum Prefatione T. Fabri; quibus adjuncta et altera Scaligerana, quam antea emendatiora, cum notis cujusdam V.D. anonymi.* The volume is a 12mo., and the new matter fills 150 pages in a large type; that which had been printed before filling 257 in a much smaller type. Throughout both, the notes are intermixed with the text. It bears to be printed at Groningen by Peter Smithæus; but is understood to have been actually printed at Saumur. In the copy of this edition in the British Museum, which appears to be perfect, there is no preface, although one is announced in the title-page; but in a subsequent edition, bearing to be printed at Utrecht by Peter Elzevir, in 1670, there is a strange address, made up principally of bursts of Greek and Latin verse, entitled, *Ad Aeliam Borellum Præfatio,* and having Le Févre's name subscribed, in which the writer says, that he has determined not to publish the promised preface, having, after he had begun to write it, been induced to desist by certain considerations which he does not choose to specify. It would, he intimates, have contained some things not generally known. The Scaligerana Prima are all, or nearly all, in Latin; the Secunda, partly in Latin and partly in French. They were afterwards mixed together and arranged under one alphabet; being first published in this form, we believe, at Cologne in 1695, in a 12mo. of 418 pages, with the title, *Scaligerana, ou Bons Mots, Rencontres Agréables, et Remarques Judicieuses, de* J. Scaliger, *avec des Notes de* M. le Févre *et de* M. de Colomiès. Such is an outline of the leading particulars, which have not always been correctly stated, of this curious portion of literary history. A German author, John Theodore Leubscher, published a short dissertation in 4to., at Wittemberg, in 1695, entitled *Historia Scaligeranorum;* and the subject is examined at greater length by Des Maizeaux, in his edition of the *Scaligerana, &c.,* in two vols., Amsterdam, 1740. As in all other collections of this kind, both the *Scaligerana* contain many things which it may be very much doubted if the person to whom they are attributed ever uttered. Any deficiency either of competency, of care, or of fidelity in the reporter, must of course have left its proportionate produce of error or misrepresentation. But even if we could be certain that the report had been given with the most perfect accuracy, it would be unfair to regard statements and opinions, thus delivered in unpremeditated conversation, as affording a true measure either of the judgment, or the information of the speaker. They may convey to us an idea of the general style and spirit of his manner of talking, and in that way give us some insight into his character; but that is almost their only value. As elucidations of the subjects treated of, they are commonly worth very little. The publication of the *Scaligerana,* accordingly, did not add to the reputation of Joseph Scaliger. The multifarious learning for which he had been celebrated was discovered to have been pretty frequently at fault in these extemporaneous displays; and having all the arrogance, with but little of the genius of his father, he was thought in most of his sallies, to have given more evidence of a bad temper than of a brilliant wit. The indecency and licentiousness of some of his jests, also, equalled their dulness.

The next of the Ana which appeared was the *Perroniana,* being notes (in French) of the conversations of Cardinal du Perron. It appeared in 1669, in a 16mo. volume of 332 pages, with the following title; *Perroniana, sive Excerpta ex ore Cardinalis Perronii: Per FF. PP.;* and, like the first published *Scaligerana,* which it closely resembled in all respects, bore the impress of P. Columesius, at Geneva. It is believed, however, to have been printed at the Hague; and there is no doubt that this book also was sent to the press by Isaac Vossius, who had obtained it from Daillé in the same manner as he had the Scaligerana. These notes had been taken down by Christophe du Puy, or Puteanus, the elder brother of Claude, Pierre, and Jacques, already mentioned; their manuscript had been copied by Claude Sarran in 1642; and from this copy Daillé had made another transcript in 1663, arranging the remarks in alphabetical order. Menage, we may remark, in his *Anti-Baillet,* Part i. chap. 80, says that the edition given by Vossius was actually published at Rouen. However this may be, in the same year, and with a similar title-page, the same person gave to the world another of these collections, the

Thuana, or remarks of the President de Thou. This he had also obtained from Daillé, to whom, like the others, they had come through Sarran, the notes having been originally taken by one of the Du Puys, but which of the brothers is uncertain. Daillé was as much dissatisfied with the editions published by Vossius of the *Perroniana* and *Thuana,* as he had been with that of the *Scaligerana;* and he caused both to be reprinted the same year at Rouen, as is believed, although the title-page says at Cologne. Both of these Ana contain some curious articles, the *Perroniana* particularly; but mixed with what is valuable, are many other things which very little deserved to be recorded; and upon the whole, neither collection can be said to come up to the expectation naturally raised by its title.

As publications, however, these works had extraordinary success; and the avidity with which they were read, produced a long succession of similar productions. It was in France, or at least in the French language, that most of the Ana appeared; and their popularity may be said to have lasted for fully half a century. In a history of French literature, therefore, an account of these collections would form an important chapter. In this place we must confine our further notice of them to little more than an enumeration of those that are best known.

One of the most valuable of this class of publications, is the *Menagiana,* a record of the conversations of Menage, who was a man of distinguished wit and talent, as well as a great scholar. He died in 1692, and the following year the *Menagiana* appeared in a 12mo. volume, both at Paris and Amsterdam. The persons by whom the materials were supplied, and the expense of the publication defrayed, were his friends Galland, Boivin, Dubos, Pinson, and De Valois. The same year was published a satire upon the work and the individual whom it commemorated, under the title of *Anti-Menagiana*—the production of a physician of Blois, of the name of Jean Bernier, whose pen, however, was not a very sharp one. A second volume of the *Menagiana* appeared in 1694; the materials of which were principally contributed by the Abbé Faydit; and two years after, a new addition of the whole was published at Amsterdam. The original edition, however, contains several things which were suppressed in those that followed. The book was republished at Paris, in 1715, by Bernard de la Monnoye, accompanied with such copious annotations as increased it to four volumes; and in the following year a new edition of the same size appeared at Amsterdam, in which De la Monnoye's additions were separated from the original, and placed in the two concluding volumes by themselves. This is the form in which the *Menagiana* has since been printed. Bayle passes a high eulogium in his dictionary upon the *Menagiana,* describing it as a nobler monument erected to the glory of Menage, than all the works published by himself, learned and able as they generally were. Upon the whole, indeed, this is perhaps the best of the Ana.

Another collection of considerable value is the Chevræana, which was published by Urbain Chevreau himself, in two volumes, 12mo., at Paris, in 1697, and again at Amsterdam, in 1700. Along with this may be mentioned the *Parrhasiana, or Remarks and Opinions of Theodore Parrhase,* under which title the well-known critic, John le Clerc, published, at Amsterdam, in 1699 and 1701, two volumes of his own lucubrations. In keeping with the name he assumed, which was intended to mean the frank speaker, the *Parrhasiana* contained a formal defence of several of his own works, in which he spoke of them in a manner that would have come with more grace from any other of their admirers than from the author himself. Another of the collections bearing this title, which does not consist of conversations reported by others, but of observations recorded by the individual himself, is the *Huetiana,* or thoughts on different subjects, of the celebrated Bishop of Avranches, which was published from his papers at Paris, in 1722, the year after his death, by the Abbé Joseph Thoulier d'Olivet: but, although this collection contains several elaborate and instructive articles, still, deliberately prepared as it was, it partakes, in great part, of the frivolity of the class to which it belongs. It would appear that persons writing under this title conceived they had a licence to trifle. The *Casaubomana,* also, which Christopher Wolf published at Hamburg, in 1710, were transcribed by him from Isaac Casaubon's own note-book, or *Ephemerides,* as he had entitled it, which had been bequeathed to the Bodleian library by his son Meric. This collection, too, has had the common fate, and has been considered to contain little or nothing worthy of the fame of the great scholar.

Some of the *Ana* are understood to be little better than forgeries throughout. Such, for example, is the character of the collection entitled *Naudæana et Patiniana, or Remarkable Singularities noted down from the Conversation of Gabriel Naudé and Guy Patin,* which was first published at Paris, in 1701. In so far, at least, as Naudé is concerned, the jests which are recorded in this work are probably about as authentic as those recounted in the hawkers' pamphlet, so popular in Scotland, professing to be a collection of the sayings of George Buchanan, which, had it been compiled in France, indeed, might possibly have received the title of Buchananana, and under that pompous designation have held a very different literary rank from what it can at present lay claim to. The *Sant-Evremoniana,* first published at Amsterdam, in 1702, is believed to be, for the most part, another of these impositions. This collection is singular, as having been published during the life-time of the person from whom it takes its name. St. Evremond lived till the following year, when he died at London, at the age of 92. He denied the authenticity of this work a short time before it made its appearance, by a letter published in the *Ephemerides Parisiennes.* Its author, or compiler, was a person of the name of Charles Cotolendi,—from whom is also believed to have proceeded a burlesque production, of little talent, entitled *Arlequiniana,* first published at Paris, in 1694.

Of the remaining *Ana,* some of the most famous are the *Poggiana, or the Life, Character, Sentences, and Bons Mots of Poggio (Bracciolini) the Florentine,* published at Amsterdam, in 1720, in two volumes, 8vo., by James Lenfant, a protestant minister, who (although the work contained little that had not been before in print) was thought to have somewhat disregarded the decencies of his profession, in giving a new impression of so licentious a miscellany; the *Furetieriana, or Bons Mots of Antoine Furetiére,* (author of the *Dictionnaire Universel de la Langue Française,*) published by the Sieur Guy-Marais, in 1696; the *Valesiana, or Thoughts of Adrien de Valois,* the Royal Historiographer, published by his son, in 1695; the *Pithœana, or Conversations of Francis Pithou,* which had been collected by his nephew, and which M. Teissier printed from a copy made by M. La Croze, in the third volume of his additions to the *Éloges* extracted from the writings of M. de Thou, Berlin, 1704; and the *Segraisiana, or Opinions of the poet Jean Renaud de Segrais,* which were taken down by a person placed behind the tapestry in a house which he frequented. This book was published both at Paris and Amsterdam, in 1722, about twenty years after the death of Segrais. So many persons still alive, however, were injuriously mentioned, or alluded to, in the book, that it was suppressed at Paris almost as soon as it appeared. It is extremely questionable for how much of its malice Segrais is really responsible. Voltaire has characterised it as being of all the *Anas* the one that best deserves to be set down in the list of printed lies, and, above all, of lies in which there is no wit. But Segrais was a man of true talent, as Voltaire himself, in his *Age of Louis XIV.,* has testified.

There are also the *Rabutiniana,* the *Santoliana,* the *Conringiana,* the *Launoiana,* the *Varillasiana,* the *Borboniana,* the *Chevaneana,* the *Sorberiana,* the *Sevigniana,* the *Longueruana,* the *Bolæana,* the *Carpentariana,* the *Ducatiana,* &c. To these may be added a few German productions, such as the *Taubmanniana,* the *Wigandiana,* the *Schurtzfleischiana,* the *Gundlingiana.* Of our English *Ana,* by far the most celebrated is the *Walpoliana,* being a collection of the conversational remarks of Horace Walpole, together with a good many fragments copied from his papers, which was first given soon after his death in portions in the *Monthly Magazine,* and then published, with large additions, in a separate form. Both in curious information and liveliness of manner, the *Walpoliana* may be favorably compared with the best French publications of the same class. Our other English *Anas,* such as the *Addisoniana,* the *Johnsoniana,* the *Swiftiana,* the *Mooriana,* are, most of them, merely collections of anecdotes taken from the common biographies of the persons to whom they refer, or of extracts from their works.

There are various publications, also, both in French and English, which might seem, from their titles, to belong to the class of *Ana,* but which are really of quite a different description. It may be sufficient merely to name a few of these, such as, the *Caribbæana, containing Letters and Dissertations, chiefly wrote by several hands in the West Indies*, 2 vols., 4to., London, 1741; the *Joineriana, or the Book of Scraps*, (by Samuel Patterson,) 2 vols., 8vo., London, 1772; the *Anonimiana, or Miscellanies of Poetry, Eloquence, and Erudition*, 12mo., Paris, 1700; the *Gasconiana*, a collection of bons mots of the Gascons, by M. de Montfort, Amsterdam, 1708; the *Pantalo-Phebeana*, a sátire on Fontenelle and others, the production of a M. Bel, a counsellor of the Parliament of Bourdeaux; the *Panagiana Panurgica*, a critique by M. de Premonval, or the book entitled *Les Mœurs*, which was written by François Vincent Toussaint, &c.

On the other hand, there are many works, which, without bearing the characteristic title of such collections, belong in all other respects to the class of the *Ana*. We have already enumerated several productions of the antients, which are of this description. One of the earliest and most celebrated of such works in modern times is the *Colloquia*, or *Table-Talk* of Luther, first published in German at Eisleben, in 1565, and afterwards in Latin at Francfort, in 1571. There is an English translation of this work, by Captain Henry Bell, published in 1652. Another is the *Locorum Communium Collectanea ex Lectionibus D. Philippi Melanchthonis*, published in 1562, by John Manlius. There is also a volume, however, published at Altdorf, in 1771, by G. T. Strobel, with the title of *Melanchthoniana*. Another very celebrated work of this kind is the *Table-Talk of John Selden*, which is stated to have been collected by Richard Milward, and was first published in 1689. But although this work is commonly reckoned among the *Ana*, it is hardly of the same class with most of those that have been designated, containing as it does little or nothing that is anecdotical, and consisting almost entirely of maxims which have no special reference to the person by whom they are said to have been uttered. It has been said that there was in existence another *Seldeniana*, or *Collection of the Conversations of Selden*, in French, being a translation from an English original entirely different from the *Table-Talk*. This is mentioned in a curious book entitled *Mélanges d'Histoire et de Littérature recueillis par* De Vigneul-Marville, first published at Rouen in 1699, which has itself been commonly reckoned among the *Ana*, and is one of the most valuable of that class of publications. It is, indeed, often referred to under the title of the *Marvilliana*. Its author was Noel Bonaventure d'Argonne; but in the latest editions it has been extended to three volumes, the last of which is an addition to the original work, by the Abbé Banier. Under this head we may also mention the *Mélanges Historiques* of Paul Colomiès, first published in 1675, and since repeatedly printed under the title of *Colomesiana*. And we might add to the list, probably, several scores of works in both our own and other languages, which are in like manner *ana* in every thing except in their titles. Boswell's *Life of Johnson*, for instance, is undoubtedly the most remarkable work of this description in existence.

Mr. Southey has published a little work in two volumes with the title of *Omniana*, being a collection of detached remarks on a variety of subjects; but the same title had been previously adopted in a French publication, of which, however, we know nothing more than that it is called *Omniana, ou Extrait des Archives de la Société Universelle des Gobe-mouches*, par C. A. Moucheron, son prèmier aide-de-camp, 12mo., Paris, 1808. It would appear to be a burlesque production.

One of the volumes of the great French work, the *Encyclopédie Méthodique*, bears the title of *Encyclopediana*, and professes to be a collection of every thing that is most curious and valuable in the different publications of this class. The remarks and anecdotes are arranged in alphabetical order; but there is no reference in general to the sources from which they have been obtained. The following works, apparently of a similar description, had also appeared before this; *Elite des Bons Mots, &c., principalement des Livres en Ana*, 2 vols., 12mo., Amst., 1707; and *Nouvelle Bibliothèque de Littérature, d'Histoire, &c., ou Choix des meilleurs Morceaux tirés des Ana*, (par Guillaume Grivel,) 2 vols., 12mo., Lille et Paris, 1765. We have in English, *Selections from the French Anas*, translated, 2 vols., 12mo., Oxford, 1797. No complete collection of the *Anas* has ever been printed; but there are several partial collections. One of the best of these is the *Scaligerana, Thuana, Perroniana, Pithæana, et Colomesiana, avec Notes par* Pierre Des Maizeaux, 2 vols., 12mo., Amst., 1740. Another larger collection, but without notes, was printed in 10 vols., 8vo., at Amsterdam in 1799, with the title of *Ana; ou Collection de Bons Mots, Contes, Pensées détachées, &c., des Hommes célèbres, tirées de différens Recueils*. This is a complete reprint, with short prefaces attached to each work, of the *Furetieriana*, the *Poggiana*, the *Menagiana*, the *Marvilliana*, the *Carpentariana*, the *Valesiana*, the *Huetiana*, (to which is added the *Lettre par Huet sur l'Origine des Romans*,) the *Chevræana*, the *Sevigniana*, and the *Bolæana*.

The most complete list of these publications which has appeared, is that given by Peignot in his *Repertoire des Bibliographies Speciales, Curieuses, et Instructives*, 8vo., Paris, 1810, in which 109 titles ending in *ana* are enumerated. This writer absurdly conceives the termination in question to be a corruption or contraction of the word *anecdota*, the title *Menagiana*, for instance, being, he says, when written properly and at full length, *Menagianecdota*. For further information on the subject of the *Ana*, the reader may consult the preface, by Wolf, to the *Casauboniana*, 12mo., Hamburgh, 1710; the *Nouveaux Mémoires d'Histoire, de Critique, et de Littérature*, par M. l'Abbé d'Artigny, 8vo., Paris, 1749, tom. i. pp. 287, &c., and tom. vii. pp. 1, &c.; B. G. Struvii *Introductio in Notitium Rei Litterariæ, cura Jo. Ch. Fischeri*, 8vo., Franc., 1754, pp. 752–763; *Morhofii Polyhistor*, lib. i. cap. xvi.; *Gott. Stollii Introductio in Historiam Litterariam*, per C. H. Langium, 4to., Jenae, 1728, pp. 54, &c.; and various other authorities referred to by Peignot. There is a well known little poem by La Monnoye, in which he enumerates the names of the most celebrated *Ana*, published and unpublished, concluding with the couplet,

Messieurs, nul de tous ces ana
Ne vaut l'Ypecacuauha.

The verses may be found in his collected poems, and also in his edition of the *Menagiana*. In something of the same spirit, Voltaire has said of these collections, that we are indebted for them for the most part to those bookmakers who live on the follies of the dead.

ANABAPTISTS, a religious sect. The word, composed of two Greek terms, properly signifies those who baptize a second time, or insist upon the necessity of a second baptism in persons whom they admit to their communion. It is sometimes applied to designate that large body of Christians in our own and other Protestant countries, one of whose articles of belief is, that baptism ought only to be administered to adults, and who, accordingly, rebaptize those who seek to join them. But this application of the name is quite unwarranted, and one against which the community in question have always protested. They do not maintain the necessity of a new or second baptism, nor are those who have been born and brought up in their persuasion ever baptized twice. Others, who may have been previously baptized in infancy, are, indeed, baptized once again when they have grown up; but this is done on the principle that the former ceremony was no baptism at all. *Baptists* is the designation assumed by those who thus hold the doctrines of the non-validity of infant, and the necessity of adult baptism; and they will accordingly be properly noticed under that head.

We are not aware, indeed, that there has ever been a sect which maintained the necessity of two successive baptisms. On the other hand it is certain, that there were various sects in the earlier ages of the church which agreed with the modern Baptists in allowing no validity except to adult baptism. But the epithet Anabaptists appears to have been first employed to describe a body of fanatics who made their appearance in Germany soon after the commencement of the Reformation; and although it has been since frequently applied to other religious bodies as being alleged to have sprung from these, such a use of it can only be considered as one of those imputations with which different sects have been in the habit of assailing each other.

The Anabaptists were, no doubt, the growth of the Reformation—though Protestant writers have laboured hard to make it appear that such was not the case. They were the ultra-radicals of the Reformation. Munzer, Stubner, and Storck, who were the first heads and apostles of the sect, had all been disciples of Luther; although no person could have more earnestly condemned their proceedings, than did that great reformer. They first began to preach their peculiar doctrines in the town of Wittenberg, in Saxony, in the year 1521. In 1525, their followers, composed almost exclusively of the lowest rabble, rose in a general rebellion against the established authorities throughout that province, Suabia, Thuringia, and Franconia. But this insurrection, which it is but fair to remark was partly of a political character, and occasioned by the oppression to which the peasantry were subjected, was soon defeated; and Munzer himself, being taken, was put to death. The novel notions, however, which he had preached, spread as usual under persecution: and, some years afterwards, the mischief broke out again with new fury. In 1532, a numerous mob of these fanatics, conducted by John Matthias, a baker, of Haerlem, and John Boccoldt, a tailor, of Leyden, suddenly attacked the city of Münster during the night, and made themselves masters of the place. Their adherents immediately flocked thither from all quarters; and elated by their success, the congregated enthusiasts are stated to have given themselves up to extravagances far exceeding anything they had before practised. Matthias named Münster Mount Zion, and proclaimed himself its king. Having madly undertaken, however, attended with only thirty followers, to attack and disperse the forces which came to recover the town, he perished, with all who accompanied him. John of Leyden now assumed the royal dignity, and under his conduct the multitude is said to have proceeded to wilder excesses than ever. The city, however, was at length recaptured by the army which the Bishop had brought up against it, on the 24th of June, 1535; and Boccoldt, having fallen into the hands of the victors, was soon after executed with the most terrific cruelties that hatred and revenge could dictate.

The most extravagant tenets, as well as conduct, have been commonly ascribed to the Anabaptists of Münster; but the accounts of a proscribed sect by their enemies, it is to be remembered, are scarcely to be received with implicit credit. The doctrine which gave occasion to their distinctive appellation was one of the least remarkable of all their peculiar articles of belief, although they are said to have inculcated it with singular emphasis and vehemence, being in the habit of declaring that infant baptism was an invention of the devil. A much more pernicious principle which they are accused of having held, at least in so far as the peace of society was concerned, was that of the unwarrantableness of all civil government, and the emancipation of the faithful from subjection to either laws or taxes. They are also said to have maintained that, among the saints, all things ought to be in common. Their speculative theology is described as having been much the same with that which has been, and still is, patronised by various other denominations of enthusiasts. It rested principally on the notion that God made his will known to them individually by special inspirations, by way of enhancing the importance of which they are said to have expressed themselves with some degree almost of contempt or disparagement of the written word. Besides the internal impressions which they called inspirations, they had dreams and visions in which they put much confidence; and some of them conceived themselves to have the gift of prophecy, which they were especially accustomed to exercise in predicting the speedy approach of the end of the world. Akin to these delusions was another favourite and fundamental dogma, that every true believer attained even in this life perfect freedom from sin. This position soon led them a great way. Finding that what had commonly been called sin could not be altogether extirpated from the bosoms even of the stoutest believers, they found it necessary, in order to save the doctrine, to declare that certain things which had hitherto been deemed contrary to the divine law, were not so at all, but in reality either indifferent or meritorious. It does not appear that they are accused of having gone quite to the extreme to which the principle in question has sometimes led, of maintaining generally that the belief of the sinner sanctified or neutralized his sin, or, in other words, that an act which would have been sinful in another became divested of its sinful character when committed by a believer. If all that is stated of them be true, indeed, they were under no necessity to resort to this device in order to give a loose to their inclinations, having put down in their list of universally permissible indulgences most of those things to which there is any violent disposition in the multitude of mankind. They condemned, for instance, with great severity, all ornamental attire, and some even went the length of objecting to clothing altogether. Boccoldt himself, in one of his fits of exaltation, solemnly promenaded the streets of Münster, stark naked. The love of dress, they said, was an artificial vanity, and as such hateful to God. But whatever, on the other hand, they held to be natural, they looked upon as harmless or commendable. Boccoldt is stated to have urged upon his followers, as in the highest degree conducive to their spiritual welfare, the practice of a liberal polygamy, and to have illustrated and enforced his doctrine by taking to himself no fewer than fourteen wives.

For a long time after the events which have been related, it was dangerous in Germany and other parts of the continent to profess an adherence to the doctrine of adult baptism, those who held that tenet being all most absurdly classed as belonging to the sect of the Anabaptists of Münster. It has been commonly said that to avoid the persecution to which they were subjected, the remains of these fanatics in course of time adopted various new denominations, some congregations calling themselves Mennonites, after an eminent leader of the sect, others Waterlandians, from the place of their principal church, others Baptists, &c. But there is really no proof that any of the communities bearing these names had, in their origin, any connexion whatever with the Münster insurgents. They were merely confounded with these madmen in consequence of holding the doctrine of the invalidity of infant baptism, which the Münster Anabaptists were also said to have preached. This accidental coincidence, indeed, was ground of identification enough for the genius of persecution in a former age, as it continues to be for that of intolerance and calumny in the present. But such misrepresentation is really not more reasonable than it would be for Roman Catholic writers, as some of them have done, to describe the Protestants generally as followers of the principles of John of Leyden, because they all, in common with him, reject the authority of the Pope; or for the Jews to bring a similar charge against the whole body of believers in Christianity. For further information on the subject of the Münster Anabaptists, the reader may be directed to Mosheim's *Ecclesiastical History*, section iii., part ii., chapter iii., where he will find the subject treated with great learning, though not in a spirit of much liberality or candour. The principal works relating to the Anabaptists are all referred to in that dissertation.

ANA′BASIS, the title of a Greek work, in seven books, by Xenophon of Athens, which describes the circumstances of an expedition undertaken by the younger Cyrus, B.C. 401, against his brother Artaxerxes, King of Persia. The expedition is remarkable as being the first long march of which we possess a detailed account, and also the oldest extant document which gave to Europeans any tolerably precise notion of the countries watered by the Upper Tigris and Euphrates.

The army of Cyrus contained a large body of Greek mercenaries, among whom Xenophon, at first, held no military rank. he went apparently as a mere spectator, and only took command after the death of most of the generals. Cyrus set out from Sardes (now Sart) 38° 34′ N. lat. 28° E. long., and marched through Asia Minor to the passes in Mount Taurus that lead into Cilicia. He next passed through Tarsus, along the Gulf of Scanderoon, and through the north part of Syria to the Euphrates, which he crossed at Thapsacus, about 35°14′ N. lat. He then marched S.E. through Mesopotamia, crossing the Araxes (the Khabour); and finally lost his life in an engagement with his brother on the plains of Cunaxa, (the site of which is unknown,) about forty miles from Babylon, (now Hillah,) 32° 28′ N. lat. 44° 14′ E. long.

From this point commenced the retreat, commonly known as the Retreat of the Ten Thousand. Instead of returning by the way which they came, it was determined to reach some of the Greek colonies on the Black Sea. Accordingly they crossed the Tigris; and advancing along the east bank of this river up the stream, they crossed in succession the Diala, and other tributaries of the Tigris. They followed the course of this river, till they were stopped about 37° 20′ N. lat., by the mountains pressing close on the river, and allowing no passage along its banks. They then crossed the mountains, and advanced probably nearly due north, but their course from this point is very uncertain. It is probable that the army passed to the west of Lake Van, and in its progress it must have crossed the Morad or Eastern Euphrates, and that branch of the Araxes which is now the Faz, and is called by Xenophon the Phasis. After enduring much hardship from snow, want of food and clothing, and the opposition of the native tribes, the army at last reached Trapezus, now Trebisond, on the Black Sea, in 41° 2′ N. lat. 39° 28½′ E. long. From Tra pezus the army marched along the coast westwards for about 100 miles (direct distance) to Cotyora.

The narrative of Xenophon contains a statement of the army's marches, with some few omissions, expressed in Persian parasangs, at the rate of thirty stadia to a parasang. The following are the distances given by him in round numbers:—

	Stadia.
From Ephesus to Cunaxa	16,050
From Cunaxa to Cotyora (eight months) . .	18,600
	34,650

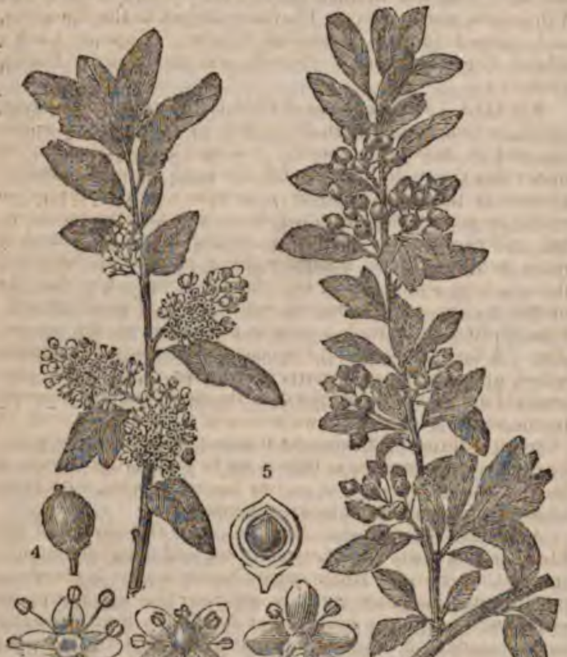
Xenophon adds the march of the Greek auxiliaries from Ephesus to Sardes (about 50 miles) to the distance from Sardes to Cunaxa.

The march may be considered as having terminated at Cotyora, as the army sailed from this place to Sinope, now Sinub: their troubles, however, continued till they reached Byzantium, now Constantinople, and even beyond that point.

If we take the stadia of Xenophon at the rate of ten to a mile, an estimate which is above the truth, we find the whole distance marched to be 3465 English miles, which was accomplished in fifteen months, and a large part of it through an unknown mountainous and hostile country and in an inclement season. The reader will find the expedition of the younger Cyrus discussed in the work of Major Rennel, and the various difficulties that occur in the narrative of Xenophon explained, as far as means of information will allow, with the Major's usual good sense and sagacity. [See XENOPHON.]

Anabasis is also the name given by Arrian, who was in all things an imitator of Xenophon, to his work in seven books, in which he describes the campaigns of Alexander the Great. [See ARRIAN.]

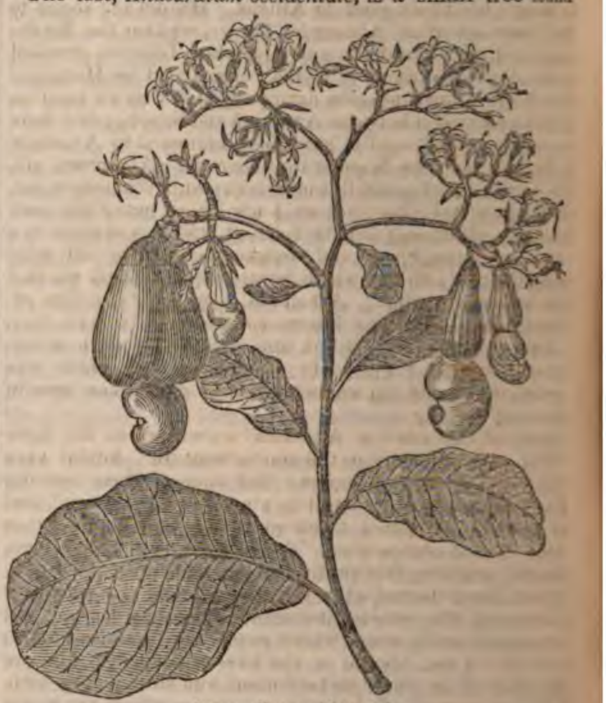
ANACARDIA′CEÆ, or the CASHEW tribe, is a natural order of plants, consisting exclusively of woody plants, abounding in an acrid resin, which is easily discovered by bruising the leaves, but which is not indicated by its being collected in transparent receptacles in the leaves, as is most commonly the case. They are polypetalous dicotyledons, with perigynous stamens, a simple, one-seeded, superior fruit, and alternate leaves without stipulæ.



[Anacardiaceæ duvaua dependens.]
1. Male flower. 2. Hermaphrodite do
3. Back of do. 4. Fruit.
5. Section of do. All slightly magnified.

Their juice is often used as a kind of varnish, for which it is well adapted in consequence of its turning hard and black when dry. It is, however, often dangerous to use, because of the extreme acridity of the fumes, which are apt to produce severe inflammation in many constitutions. The best-known genera of the order are, in the first place, *rhus*, or the sumach, so many species of which are cultivated in our gardens; and the *pistacias*, the nuts of which are served at desserts, and their juice is commonly sold in the shops under the name of mastich and Scio turpentine. Besides these, there are the Chilian *duvauas*, which resemble myrtles, the *mango*, the fruit of which is so delicious in tropical countries, and the *Cashew*, or *Acajou nut*, anacardium, from which the order takes its name.

The last, *Anacardium occidentale*, is a small tree found all over the West Indies, where it is much cultivated for the sake of its bunches of fragrant rosy flowers, as well as of its fruit. Its stem, if wounded, yields abundantly a milk, which, when inspissated, becomes intensely black and hard, besides which, it secretes a gum not inferior to gum arabic. The nut is a kidney-shaped body, seated on a large fleshy protuberance resembling a peach, or an apple, and being in fact, the extremely dilated disk or receptacle; the latter is sometimes red, sometimes white, and is employed by the West Indians in various ways. The nuts contain, in abundance, beneath the outer shell, the black caustic oil of the order, which, when volatilized by heat, as happens in the process of roasting, is apt to produce erysipelas and other disagreeable affections in the face of persons standing over the fumes; the kernel is a well-known wholesome article of food. In the West Indies it is used as an ingredient in puddings, is eaten raw, and is roasted for the purpose of mixing with Madeira wine, to which it is thought to communicate a peculiarly agreeable flavour. In this country, the Cashew nut never flowers, and can only be cultivated as a tender stove plant.



[Anacardium occidentale.]

ANACHARSIS THE YOUNGER. [See BARTHELEMY.]

AN′ACREON, one of the most famous lyric poets of Greece. Little is known of his personal history. He was born at Teos, a city of Ionia, in Asia Minor, and was probably of obscure birth, since the name of his father has not been ascertained, and four persons are mentioned by Suidas, to whom that honour has been ascribed. Madame Dacier, on the other hand, has endeavoured to prove that he was a relation of Solon and Pisistratus, and a descendant of Codrus, and thus connected with the noblest blood of Athens; but it has been shown by Bayle, that the passage of Plato, on which she founds this assertion (Charmides, 157, ed. Steph.; p. 54. Priestley), cannot be made to bear such a meaning. The exact periods of his birth and death are unknown; but he began to be distinguished in the 35th Olymp. B.C. 559, about the beginning of the reign of Cyrus, and he came to Athens in the reign of Hipparchus, B. C. 525, according to Clinton. There is nothing irreconcileable in these dates, though rather distant; since he lived to the age of 85. It is said that he was unable to take any food except raisins, from extreme old age, and that he was at last choked by a grape-stone, but this anecdote bears too much the appearance of a poetical fiction, founded on the uniform tenor of his writings. He was held in high esteem by Polycrates, tyrant of Samos, and Hipparchus, son of Pisistratus, tyrant of Athens, two of the most eminent men of their age. The latter, we are told by Plato, (Hipparchus, 228 Steph.) sent a fifty-oared ship to bring the Teian poet to Athens. His old age seems to have been spent at Abdera in Thrace, whither the Teians emigrated, and founded a new city, when Teos was attacked by the Persian troops of Cyrus, commanded by Harpagus (B.C. 538). Some persons have pretended that an amorous connexion existed between Anacreon and Sappho; and there are verses extant, said to have been addressed by Anacreon to Sappho, and by Sappho to Anacreon; (Athenæus, xiii. 598-9, ed. Casaub.) but this involves a manifest anachronism. Of his personal character we know little; but if his own testimony of himself is to be believed, his life was spent in a course of debauchery and drunkenness; love and wine being the only things which he professes to think worth a wise man's attention. Athenæus, however, (x. p. 429, ed. Casaub.) and Madame Dacier, consider him to have been a man of temperate habits, and regard this garb of immorality merely as a poetic assumption. A statue was erected at Athens, representing him as a drunken man in the act of singing.

Some of the odes of Anacreon are written in the Ionic dialect, and generally in the iambic measure. Suidas says that he also wrote Elegiacs; but none of these remain. His extant poems are entirely amatory and convivial, and are generally admitted to afford the best specimens extant of this kind of composition. As such they have been much admired, and very frequently imitated and translated. Few, however, have succeeded in preserving the elegant simplicity of Anacreon, who seldom indulges in the forced conceits and extravagant prettinesses which so often disfigure the poems of his imitators. Some of the odes attributed to him are very deficient in real poetic feeling, and savour very little of the character of that remote age in which the writer lived. Some also, if we may judge from the language, are undoubtedly the productions of an age long after that of the poet. Of those who have attempted to present him in an English dress, the most celebrated, and the most successful, are Cowley, who translated twelve odes, and Moore. But the translations of the former should rather be called paraphrases; and the version of the latter is too much loaded with ornament, too studiously brilliant, to convey an exact idea of the style of his original. Some pretty specimens of the poet (including one or two of Cowley's translations) will be found in Merivale's *Anthology*.

Anacreon was first edited by H. Stephens, who got possession of two manuscripts, and published them, after careful collation, in 4to., in 1554. Many learned men at the time believed this to be a literary forgery, a supposition highly honourable to Stephens' powers of Greek composition; but this notion was dispelled by the discovery of the Vatican manuscript. It has been doubted, however, whether all the odes bearing the name of Anacreon, though ancient, belong to that poet. Pauw and Fischer believe the greater part of them to belong to authors of much later date. Tanaquil Faber stigmatised the 6th, 18th, 23rd, 24th, 25th, 26th, 27th, 32nd, 39th, 41st, 50th, 51st, 53rd, and 55th as spurious, chiefly on the ground of metrical inaccuracy, and of their being written in the Dorian, instead of the Ionian dialect. His daughter, however, the celebrated Madame Dacier, who translated Anacreon into French, does not always think him justified in rejecting them. A doubt has recently been suggested (Merivale's *Anthology*), whether the poems now passing under the name of Anacreon are those which were extant in the time of Horace, on the ground that there is only one passage in Horace which appears to have been taken from the Grecian lyrist; that beginning 'Vitas hinnuleo me similis, Chloe.' (Od. i. 23. 1.) This argument, however, does not appear conclusive.

The best edition of Anacreon, we believe, is by Mehlhorn, Glogau, 1825; the third of Fischer, Lips., 1793; and Brunck's second edition, Strassburg, 1786, are also highly spoken of. There are many pocket editions of this author, and many remarkable only for typographical luxury, which we need not here particularise.

ANADYR is a river in Siberia, little known, and principally remarkable for being the only considerable river of the globe, whose sources lie within the Polar circle, between the 68° and 69° N. lat. It rises in a lake in that range of the *Aldan* mountains, which traverses the north-eastern extremity of Asia, and terminates in Cape *Tshukotshkoi-Noss*, at Behring's Strait. The first third part of its course is directed to the south-west through nearly 3° of lat. till it passes to the south of the Polar circle. It then turns suddenly to the east, and continues in this direction, though declining insensibly to the south; but the lower part of its course lies nearly parallel to the Polar circle, at the distance of about 2½° of lat. In its eastern course it passes through 13° of long. It falls into the Bay of Anadyr, a large gulph of the Sea of Kamtshatka, forming an æstuary at its mouth. The whole course of this river is upwards of 500 miles.

The country which is traversed by this river is almost entirely covered with rocky, naked, and barren hills, which sometimes rise to the height of mountains, though, as it seems, they do not attain the line of eternal snow. As the winter lasts about nine months, and all this time the ground is frozen and covered with snow, even the patches of low ground along the river are not available to the rearing of cattle; and the rein-deer and the dog are the only domestic animals of the nations which inhabit this corner of the world. The rein-deer in a wild state is very numerous, distinguished by its spotted skin, and forms the most important object of chase with the inhabitants. The greatest part of the population inhabit the country about the mouth of the river, and the small bays in its neighbourhood, where the great number of fish and marine animals, especially of morses (*Tricherus Rosmarus, L.*), affords them abundant food. These people have fixed habitations, but those who live on the produce of their herds of rein-deer, and of the chase, wander about like the Laplanders.

The country on the north of the river is inhabited by the *Tshukshes*, who, according to Captain Cook, are not of a diminutive size, as was formerly believed, but rather tall, well made, and strong. They have defended themselves with valour and success against the Russians, and are not obliged to pay a tribute like the other nations of Siberia. To the south of the Anadyr, there is another nation, the *Korakes*, who are neither so tall, nor so well made as the Tshukshes, nor so brave. They are subject to the Russians, and obliged to pay an annual tribute. (Captain Cook's *Third Voyage*, Georgi's *Travels*, and the *Map* in Pallas' *Travels*.)

ANAGA'LLIS, a genus of the natural order *primulaceæ*, among which it is known by its flat, or wheel-shaped corollas, and by its capsule opening into two halves, of which the upper fits the under like the lid of a box. A very common species is the *pimpernel*, or *poor man's weather-glass*, so called because its flowers generally open at eight in the morning and close in the afternoon, and also refuse to expand in rainy weather. It is a little trailing plant with brick-red flowers, very abundant in corn fields; it was once thought useful in cases of madness, especially such as arose from the bite of rabid animals, but it is in no esteem at the present day. A far more beautiful species is the *anagallis tenella*, which grows in the drier parts of marshes, along with *pinguicula* and *drosera*; it has delicate flesh-coloured flowers, in the centre of which grows a cone of stamens covered all over with glittering transparent hairs; these and its peculiarly neat appearance, entitle it to be called the queen of British wild flowers. One or two foreign species, with large blossoms, are cultivated in greenhouses.

ANAGNI, the ancient Anagnia, once the capital of the Hernici, is now a town of between 5000 and 6000 inhabitants, in the Campagna of Rome, with a bishop's see. It stands on a hill above the valley of the Sacco, near the Via Latina, or road leading into the kingdom of Naples by San Germano, in the middle of a fertile, agricultural district. It is the residence of many noble families, twelve of the oldest of which are called *the twelve stars of Anagni*, having at their head the family of Caetani, from which sprung Pope Boniface VIII., and that of Conti, which has given the Church of Rome four pontiffs, among whom is Innocent III. Anagni often afforded a refuge to the popes during the troubles of the middle ages. Here Alexander III. excommunicated Frederic Barbarossa, and here the turbulent and irascible Boniface VIII. was surprised and made prisoner in 1303, by the Colonna faction, stimulated by his enemy Philip le Bel of France; owing to this affront, the old man soon after died of grief. It lies 35 miles east by south of Rome.

A'NAGRAM signifies a new word formed out of the letters of any given word by the process of writing them over again, as the term literally signifies, or placing them in a new order. Sometimes the anagram is formed out of two or more words, and it may be itself always either one word or several. Some traces of this species of trifling have been detected in the writings of the antients; but the taste for it does not seem to have spread much among the Greeks or Romans. Although instances of the use of the anagram for various purposes may have been discovered of an earlier date, the artifice appears to have first become fashionable in modern literature in the early part, or towards the middle, of the sixteenth century. Many authors, instead of putting their names on the title-pages of their works, have, with an affectation of modesty, used the anagrams of their names. At one time also the anagram was much made use of by mathematicians in announcing discoveries, the credit or property of which they wished to secure to themselves without revealing the secret in which they consisted. Huyghens, Galileo, and Newton, intimated several of their discoveries in this way. (See the *Life of Galileo* in the *Library of Useful Knowledge*, chap. viii.)

ANALEPTICS, from a Greek verb which signifies to *restore*, comprise all the means, whether medicines, diet, or regimen, which are generally employed to restore the vigour of the system when it has fallen below the healthy standard, either from previous disease or any other cause. The term analeptic was formerly applied indiscriminately to any medicine which increased the powers of the system, whether it belonged to the class of stimulants or to the class of tonics; but as the progress of chemistry, anatomy, and physiology has enabled us to recognize a difference in the chemical composition of members of these two classes of medicinal agents, as well as in their manner of acting upon the human frame, we propose to limit the application of the word to the latter of them, or to tonics, reserving the consideration of the other till we come to the word stimulant. The following brief explanation of their effects will suffice to justify this proceeding. Stimulants act primarily on the nervous system, while tonics act primarily on the muscles and blood-vessels. Stimulants render the movements more frequent; tonics render them stronger. Stimulants, as we see with wine, exhaust the excitability; tonics, within a certain limit, maintain it. The action of the one is immediate and transitory, that of the other is slow and progressive, but more permanent, as is the case from Cinchona bark, or food. To take an example from their effects on the stomach, excitants quicken the digestion, as we see with capsicum or cayenne pepper, which we take with articles difficult to digest, as salmon; while tonics render the digestion more perfect, as occurs when we use cinchona in convalescence from disease. Though the most perceptible effect of tonics be upon the muscular system, as it is by a display of its powers that we judge of strength, yet the whole system feels the benefit of them when appropriately administered. Every person knows that he can, at one time, lift a weight with ease which, at another time, he cannot move but with difficulty and exertion. In the former case, he is pronounced *strong*; in the latter, *weak*.

The nature of the muscular fibre need not be discussed here; it is enough for us to remark, that to execute its functions properly, it must be in a certain state of tension, that it may be possessed of sufficient elasticity. A cord proceeding from a fixed point cannot influence a moveable body till it be drawn tight; so a muscle cannot raise a limb unless it possess a certain degree of tightness. The difference of the power of muscles varies greatly, according to the state of health or disease of the individual. If a muscle be taken from an animal in good health, it will not only bear a greater weight than the same muscle taken from an animal which has long been sick, but the former will be many days before it goes to decay and allows the weight to drop, while the latter will decay very speedily.

To maintain the muscular fibres in this condition, a due supply of blood and of nervous energy is requisite. The sources of these are in a healthful and vigorous digestion, and as this rarely goes on when the system is much disordered, or suffering under general or considerable local disease, scarcely any morbid action, or even the natural exercise of mind or body, if pushed to an extreme, can continue without producing debility. Tonics are, sooner or later, required, seldom, indeed, to remove disease, but to obviate its effects, or that of the treatment it has been necessary to employ. The use of these requires the greatest circumspection, for, till we have removed the cause of the disease, they can rarely be of service; on the contrary, they often do harm.

We have above pointed out the connexion between the state of the digestive functions and the energy of the other functions, and it is important to bear in mind that anything loading and oppressing the stomach and bowels will lessen the tone of the system, diminish the disposition for exertion, and clog alike the action of mind and body. A judicious practitioner will here give, according to circumstances, an emetic or a purgative, and repeat this last for three or four days successively: in proportion as these act well, the languor and listlessness disappear, the mind resumes its wonted activity, for the cloud which had obscured the mental faculties is dissipated, and all again is energy, elasticity, and strength. An unskilful practitioner, and still more frequently the patient or his friends, would recommend some stimulant, a little brandy, or some bitters, under the influence of which all the symptoms become aggravated. It is a still worse case when the debility which occurs at the commencement of fevers, particularly ague and typhus, is so treated, though this is not so common an occurrence. A state of great irritation (morbid sensibility), or subacute inflammation of the mucous or inner membrane of the stomach, is a frequent condition of that organ with the inhabitants of towns, particularly among merchants and others engaged in extensive business which engrosses their whole attention, giving rise to much anxiety and leaving little time for exercise or food at proper times. The employment here of tonics, in the first instance, will only convert a manageable case into a difficult and serious one. It is, therefore, rather in the stage of convalescence from acute disease that tonics are required, and as a sequence to other medicines, than articles to be employed in the commencement, if we except some affections of the nervous system.

We need not enter into details respecting the particular action of tonics upon each set of organs of the body, as it may be stated generally that they all, sooner or later, begin to execute their functions more vigorously, the stomach first feeling the beneficial effects. But this state of improved action follows their use (*i.e.*, when they are medicinal or material tonics) only for a time; for their continued employment leaves the stomach in a state of debility, perhaps greater than at first—a fact of which we should never lose sight. These remarks will, we trust, induce all to observe caution both in taking upon themselves to use the articles termed analeptics merely because they feel weak, without knowing what is the cause of the weakness, or in urging their friends to have recourse to them at the commencement of disease, or even when it is subsiding, as more relapses are occasioned by a premature employment of tonics, whether medicinal or dietetic, than by all other causes combined.

It is impossible to enumerate here, and give directions for the use of, all the analeptics, comprising, as they do, medicines, food, and regimen. The medicines are either from the mineral or vegetable kingdoms: when the former, they are chiefly preparations of the metals, as the salts of iron and flowers of zinc (oxide of zinc); from the latter, they are invariably bitter substances, as Cinchona bark, Calumba, quassia, chamomile, &c. The analeptic means which fall under the head of regimen are, bathing, exercise, and the diversion of the mind.

The employment of the medicines will be stated under the diseases to which they are suited; bathing will be treated of under that head: it is, therefore, only upon the last two means that we will make any remarks here.

An examination of the human frame demonstrates that it was intended for motion, alternately with repose, and not for a state of absolute quiescence. Nor is the mind, which is furnished with so many faculties and provided with so many organs of sense, which serve to connect it with the external world, less calculated for active exertion. Any attempt to contravene the law of nature which enjoins a reasonable exercise of mind and body, brings a punishment upon the individual; the mind which he allows to be inactive loses the capacity for exertion, when required, and the body becomes a prey to disease in some shape or form. The action of the muscles is necessary to aid in circulating the blood and in completing the process of digestion, as well as to ensure a regular motion of the bowels. Where the muscles are not exercised, the blood, instead of reaching the surface and the extreme vessels, accumulates in the large internal trunks, leaving the skin dry and bloodless, as seen in young chlorotic females, who, instead of appearing buoyant with life in every limb, are as pale, and almost as inanimate, as a statue. Disorders of the nervous system, as hysteria, likewise show themselves. These states can only be warded off by regular exercise. The rising generation would be much benefited, if instruction in any branch of natural history formed a part of their education; young persons would then be furnished with motives for taking exercise out of doors—to the manifest advantage of the figure of the body and the tendencies of the mind. This is well explained and enforced in a note (p. 101) to a small work called *Botanical Geography*, published by Relfe, Cornhill.

Where older people have neglected exercise, it is more difficult to find means to induce them to resume its use; but some such device as the following may be tried: 'Ogul, a voluptuary, who could be managed but with difficulty by his physician, on finding himself extremely ill from indolence and intemperance, requested advice:—"Eat a basilisk stewed in rose-water," replied the physician. In vain did the slaves search for a *basilisk*, until they met with Zadig, who, approaching Ogul, exclaimed, "Behold that which thou desirest! But, my lord," continued he, "it is not to be eaten; all its virtues must enter through thy pores; I have, therefore, inclosed it in a little ball, blown up, and covered with a fine skin; thou must strike this ball with all thy might, and I must strike it back again, for a considerable time, and by observing this regimen and taking no other drink than rose-water for a few days, thou wilt see and acknowledge the effect of my art." The first day Ogul was out of breath, and thought he should have died of fatigue; the second he was less fatigued, and slept better: in eight days he recovered all his strength; Zadig then said to him, "There is no such thing in nature as a basilisk! but *thou hast taken exercise and been temperate, and hast, therefore, recovered thy health!*"

The Indian rubber, or caoutchouc balls will be found as useful for those confined by the weather within doors during the winter months, as the ball of Zadig.

It is possible to fatigue the body beyond a proper point, in which case repose becomes necessary; but this is a rare occurrence compared with the instances where the mind is stretched beyond its natural power to bear by the ambitious student, the covetous and care-worn merchant, or the adventurer in political life. If, in consequence of long-continued exertion, the balance of the mind be not already lost, abstraction from his books for the one, and a withdrawing from their pursuits for the others, with change of scene and occupation, must be enjoined: by doing this before it is too late, each may, in time, return to his usual station, to be useful in his sphere to himself and others, and may still be permitted to enjoy the greatest of earthly blessings,—a sound mind in a healthy body.

ANALOGY is the similarity of ratios or relations. A *ratio*, or *relation*, means that two objects (which are called *the terms of the ratio*) are considered together in reference either to some quality which they have in common, or to some manner in which one has affected the other. Thus, two things may stand in a certain relation to each other in respect of their quantity, magnitude, shape, colour, strength, height, &c.; in which cases the subject of comparison is common to both, and belongs to them to a greater or less amount. Thus, when we say that one thing is larger, taller, thicker, smaller, darker, more beautiful, more lasting, more desirable, more formidable, more probable, &c. than another, we mean that each of the pairs in question having in common the quality referred to, the former has it in a greater degree than the latter. These, which might be called *ratios of degree*, differ altogether from the other class, which includes all those relations arising from the manner in which one term of the ratio has affected the other, or is necessarily connected with it, and not from any attribute which they possess in common. Thus, we may speak of the relation of God and man, of the relations of men as members of the same political society or of different political societies, of the relation of a bird to its egg, of a tree to its fruit, &c.; in which instances some act done by one to the other party, or by both reciprocally, or some influence which one term has exercised over the other, is signified, and not any quality or attribute common to both. In some cases of the latter kind there are words which express each term of the ratio *in respect of the relation;* and, therefore, they mutually imply each other. Such are, for example, parent and child, debtor and creditor, agent and principal, lessor and lessee, &c. As in these cases it is impossible to conceive the one without conceiving the other term, the latter might be called *ratios of implication*[*], as distinguished from those ratios in which a comparison is made of qualities existing independently in the things compared. For example, there cannot be a husband without a wife, or subjects without a sovereign, nor is there any quality which a husband has, as husband, independent of the wife, or the sovereign as sovereign independent of the subject; but although there cannot be a short man or a tall man without a man of middle size, yet the height of the short or tall man is an absolute quantity, and independent of the comparison. In the cases of a common property, or ratios *of degree*, there are words which denote the *relation* of one term to the other, as lowness, height, depth, and consequently imply both terms of the ratio; but there is no word which expresses the *term* of the ratio itself, as in the case of ratios of *implication*. (See Locke, *On the Understanding*, b. ii. c. 25.)

When two ratios are compared, that is, when it is affirmed that the relation of two things is like the relation of two other things, the two ratios together form an *analogy*, and each pair of the corresponding terms of the two ratios is *analogous*. Thus, the bark stands in a similar relation to a tree as the skin to an animal; and consequently the one bears an analogy to the other: so the feathers of a bird are analogous to the hair of a quadruped, the admiral of a fleet is analogous to the general of an army. Of this nature are all fables and parables, in which the circumstances of the person to whom the lesson is addressed are illustrated by a parallel case, that is, by supposing a relation similar to that in which he is placed. Thus the case of a man who affects to despise what is out of his reach, is vividly portrayed by the fable of the Fox and the Grapes; and so in other cases: the parables of Holy Writ are instances of a similar mode of instruction, only the examples are not, as in fables, chosen among irrational animals. [See FABLE.] The same is the principle of grammatical and etymological analogy: thus, if *to give* is conjugated *I give, thou givest, he gives*, *to live* would be conjugated *I live, thou livest, he lives;* the inflexions of the verbs standing in a like relation to each. So the verb *rattle* is derived from *to rate*, as *prattle* from *to prate*, and *hobble* from *to hop: little* is derived from the old word *lite*, as *mychel* or *myckle* from *much*, &c. Thus, *kingly* is to *king*, as *royal* to the French *roy*, and *regal* to the Latin *rex*, or rather to the root *reg*, which two latter substantives have not been naturalized in English. The formation and development of language proceed almost exclusively on this principle.

From what has been said it is evident, 1. That in an analogy there must be two ratios, and consequently four terms or objects of comparison; and 2. That there is no connexion between resemblance and analogy, and that things may be analogous without being similar, and similar without being analogous. 1. With regard to the first of these propositions, it should, however, be observed that, although there must be four terms, it is not necessary that all the four terms should be different. If there was such a necessity, one of the chief uses of analogy, as an engine of argument and discovery of truth, would be destroyed. All that is required is, that there should be two distinct ratios: of what terms those ratios may consist is indifferent. Thus, in the case of brethren, the parents are in an analogous situation in respect of each brother: so the grandfather is to the son as the son is to the grandson. In such cases as these, both the relations are known: frequently, however, the relation in which one thing stands to another being known enables us to discover, with greater or less certainty, the relation which the same thing bears to something else, which is unknown. Thus the moral government of mankind by the Deity, in this world, furnishes a means of conjecturing his religious government, both in this world and the next, independently of a Divine Revelation. So the past conduct or performances of a nation, a government, a minister, a

[*] There are some words used to denote the state of one of the terms of a ratio of implication when the relation has been destroyed: thus, *widow*, means an unmarried woman who was once a wife, *orphan*, a child whose father is dead, &c. Sometimes the terms denoting a relation are applied by anticipation before the ratio begins to exist: thus a person is popularly called an heir in the ancestor's lifetime, although *nemo est heres viventis*.

general, a lawyer, an architect, a painter, a poet, a racehorse, &c., afford materials for judging what will be their future conduct or performances under similar circumstances. It is to this most important use of analogy that Quintilian refers, when he says that its purpose is to discover what is unknown by what is known, to prove what is uncertain by what is certain.

2. Resemblance being the similarity of some sensible quality, as form, colour, taste, smell, or sound, it has evidently no connexion with analogy; and if things analogous happen to resemble one another, their resemblance is a mere accident, independent of their analogy. Thus, two brothers may resemble each other; but they might equally resemble each other without being brothers, and would be equally brothers if they did not resemble each other. The confusion of analogy and resemblance is, however, of very frequent occurrence, and numerous examples of it might be cited. It is, we believe, the opinion of several commentators on the New Testament, that, in the passage of St. Matthew where the Holy Ghost is stated to have descended 'as a dove,' it is meant, not that the Holy Ghost descended in the form of a dove, but that the Holy Ghost descended as a dove descends. In a similar manner, Homer says that Apollo and Minerva sat, like birds, on the branches of a tree near the Scæan gate of Troy; by which he meant, as birds sit on the branches, so did the god and goddess: but Pope, in his translation, represents them as undergoing a change of form, and assuming the appearance of birds.

The above examples may serve to illustrate an error of frequent occurrence in the use of the argument from analogy. As, in the instances just cited, the similitude is extended beyond its proper limits, and it is supposed that because the two objects are like each other in *one* respect, they are like in *all;* so the analogy between two things is sometimes pressed beyond its just application, and is carried out of the bounds of the relation in virtue of which the comparison was made. Thus the injunction to be 'as wise as serpents and harmless as doves,' does not recommend to our imitation either the envenomed ferocity of the one, or the helpless timidity of the other animal. Two false analogies may be mentioned which at one time had a powerful influence on political discussions, nor are even now quite exploded, viz., that the existence of the human race, and the existence of nations, are analogous to the life of a single man. For some purposes these two relations might doubtless be compared; but when it is argued that a nation will pass through a series of changes corresponding to the childhood, manhood, and old age of a single human being, or that the early state of mankind was like the innocence and simplicity of an infant, the comparison is unwarrantably wrested out of the range of its proper application. The notion of the corruption of a nation by luxury appears to have had a like origin; for *single individuals* may be, and often are, depraved by a sudden change from poverty to riches; but the process by which a *nation* enriches itself, is a mark of habits very different from vicious indulgence and effeminate indolence.

All analogical comparisons are made by means of abstraction; a certain attribute belonging to each of two objects is considered separately from all the other attributes which those objects may possess, and a comparison is instituted between them in respect of that common attribute. Thus, the analogy between the skin of an animal and the bark of a tree arises from our leaving out of our consideration all those circumstances in which they differ, such as their colour, consistency, animation, sensibility, &c., and paying attention only to the use of each, as the outward covering, in one case, of the body and limbs of the organized being, and in the other, as the outward covering of the woody matter of the tree. [See ABSTRACTION.] It is by a like process of abstraction, that an extended and vague meaning is given to many general terms, particularly those belonging to the moral sciences; and in this manner they are applied to objects to which they are only *analogous*, and which they do not properly designate. Thus a *law*, in its original and strict sense, is a general command of one rational being to another: but as one of the effects of such a command is to produce a uniformity of conduct in the person or persons to whom the command is addressed, the word has been transferred to inanimate objects in which there is a uniformity of phenomena; and although there is no command received, no command given, and no intelligence to work upon, we yet speak of the laws which regulate the motion of matter, the succession of the seasons, the diffusion of heat and light, and other physical appearances which follow in a constant relation of cause to effect. In this case the proper characteristics of a law being neglected, one of its relations is alone considered; and hence the analogical application just mentioned. When such an application is made, not from a vague or inaccurate use of language, but from a desire to add beauty or energy to the expression by the transfer of words, this transfer, and sometimes the transferred word itself, is called a *metaphor*. Thus when Shakspeare represents Macbeth as saying of Duncan that

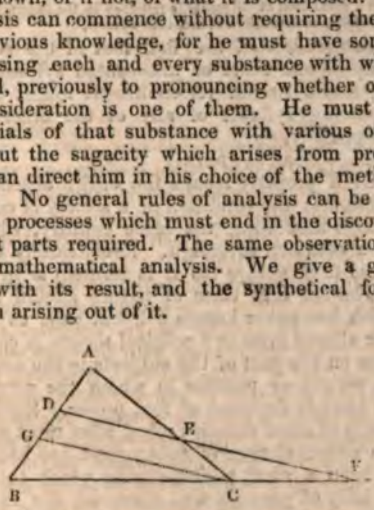
> His virtues
> Will plead like angels, *trumpet-tongued*, against
> The deep damnation of his taking-off,

he means that Duncan's virtues will arrest the public attention as forcibly as the sound of trumpets. The analogy is obtained by referring the two objects compared to the general class of things which instantly attract universal notice. [See METAPHOR.]

The word *proportion* properly signifies an analogy of quantities or magnitudes, as a proportion of numbers, lines, surfaces, &c. In popular usage, however, *proportion* is commonly made synonymous with *ratio*, as when we speak of the proportion of deaths to births, the proportion of wages to profits, the proportion of convictions to commitments, &c. Sometimes also it is used for *portion*, as when we speak of a large proportion, a small proportion, a fair proportion; in this case, however, a ratio is meant, as the *part* is considered as bearing a certain relation to the *whole*. On the subject of Analogy, see Aristotle's *Poetic*, c. 21; *Rhetoric*, b. ii. c. 2; *Hist. An.* l. c. 1; Coplestone in the Appendix to *Whately's Rhetoric;* Whately's *Rhet.* part i. c. 2. s. 6.

ANA'LYSIS, a Greek word, signifying literally *the act of unloosing* or *untying;* its opposite is *synthesis*, which is the act of putting together. The modern meaning of the term analysis, is the process by which facts, results, or reasonings are separated into their simple and component parts, or by means of which a simple truth is obtained, when given in a more complicated form; so that, in its most general sense, the greatest part of human knowledge consists in the results of analysis. It is, however, for the most part applied in a more particular manner to the methods employed in those branches of inquiry, which most strikingly exhibit direct analysis; viz., mathematics and natural philosophy, particularly chemistry. By a very incorrect misnomer, algebra, the differential calculus, &c., have been called by the general name of *analysis*, in opposition, not to *synthesis*, but to *geometry*, in which latter science synthetical methods are most usually applied. This perversion of the term prevails on the Continent to such an extent, that it must always be taken for granted, that '*analyse*' stands for the algebraical branches of pure mathematics. In this sense it is again subdivided into 'algebraical analysis' and 'infinitesimal analysis,' the latter including the fluxional or differential calculus. And by 'geometrical analysis' is frequently understood the application of algebra to geometry. It must, however, be remarked, that the exact sciences have appropriated this word, simply because in these branches of knowledge the use of analysis has been made most conspicuous.

Confining ourselves to the primitive meaning of the term, it is obvious that all discovery must be entirely either the work of analysis or of accident; and that, therefore, geometrical analysis must be as old as geometry. Nevertheless this does not appear from the earliest treatises. The work of Euclid is strictly synthetical. Instead of taking the proposition asserted, and examining it by means of preceding propositions, and in the mean time assuming it to be true, in order to ascertain whether the results deduced from it agree or disagree with what has been already proved,—Euclid first enunciates the point which he means to establish, and then proceeds to put together the considerations by which it is demonstrated, leaving the learner nothing to do but to judge of the truth or falsehood of each argument as it arises, without taking into consideration the methods by which the arguments themselves were first obtained. This is the natural and proper method of teaching what has already been discovered, for its own sake; not only because it neglects to introduce difficult and embarrassing considerations, and allows of the subject being broken up into portions which are easily learnt at one time, but because there is, in reality, no perfectly general and certain method of analysis which can be made obvious to the beginner. In attempting the analysis of a new problem though the discoverer will naturally first try those methods which have been successful in preceding cases, he has no means of assuring himself beforehand which will be successful. The chemist is similarly circumstanced. Let a new substance, or one supposed to be such, be presented to him, from which he is required to find out whether it is already known, or if not, of what it is composed. No effective analysis can commence without requiring the results of all his previous knowledge, for he must have some method of recognising each and every substance with which he is acquainted, previously to pronouncing whether or not that under consideration is one of them. He must then proceed to trials of that substance with various others, and nothing but the sagacity which arises from previous experience can direct him in his choice of the methods to be employed. No general rules of analysis can be laid down, that is, no processes which must end in the discovery of the component parts required. The same observations may be made on mathematical analysis. We give a geometrical instance, with its result, and the synthetical form of the proposition arising out of it.



The sides of a triangle ABC are cut in D, E, and F, by a straight line. Six segments are thus formed, AD and DB, whose sum is the side AB; AE and EC, whose sum is the side AC; and BF and FC, whose difference is the side BC. It is required to investigate the relation which exists between these six segments, if there be any relation.

Some relations will be thrown out of the question upon the slightest consideration: the sum of the six lines is not the same in every triangle, neither is their product. Leaving this unorganized method of examination, we recollect, that if CB were parallel to DE, the then similar triangles ADE, ABC, would give a well-known relation between AD, DB, AE, and EC. To try whether this may help us, draw CG parallel to DE, which gives the proportion

$$AD : DG :: AE : EC,$$

or if we represent the lines by the number of units which they contain,

$$AD \times EC = AE \times DG \quad . \quad . \quad (1.)$$

Because GC is parallel to DF, we have

$$GD : BD :: CF : BF,$$

$$\text{or } GD \times BF = BD \times CF \quad . \quad . \quad (2.)$$

and the equations (1) and (2) multiplied together, and the result divided by the common factor GD, gives

$$AD \times EC \times BF = AE \times BD \times CF \quad . \quad . \quad (3.)$$

whence the relation required between the six lines is as follows:—Let them be separated into two lots of three lines each, in such a way that no two lines which have a common extremity are both in the same lot; then the product of the first three will be equal to the product of the second three.

If instead of asking for the relation, if any exist, between the six lines, the equation (3) had been given, and it had been required to detect whether it were true or false, the process would have been similar; and we should have found that the equation (3) is true, and a necessary consequence of the proposition, that a line drawn parallel to one side of a triangle divides the other sides into proportional segments.

The synthetical form of the preceding process differs from it much less on the paper than would be the case in the mind of a student, who had actually hit upon the solution in the progress of investigation. For, not being able to tell the various steps by which one of our readers would endeavour to arrive at the same conclusion, we are obliged to prompt him with a right guess, and thereby give him only a synthetical description of that which was in our minds an analytical process. It only remains, therefore, to make the demonstration synthetical in form, which, as will now be readily seen, will consist in stating the proposition to be proved, directing to draw CG parallel to DF, without giving any reason, and combining the steps of the preceding demonstration.

The geometrical analysis is generally ascribed to the school of Plato; but, in reality, as we have already observed, must be of a date as early as geometrical reasoning itself. The use of PORISMS, or problems, [see also LOCI,] admitting an indefinite number of solutions, the establishment of the properties of the CONIC SECTIONS, and the various efforts made for the DUPLICATION of the cube and the TRISECTION of the angle, all of which were the work of the school already mentioned, most certainly increased the power of the analyst, that is, made the means of discovery more obvious and more successful: but there is nothing in the methods which entitles them to the exclusive appellation of geometrical analysis.

The peculiar distinction between algebra and geometry is, that the analytical method is pursued in the former from the commencement. The solution of a problem consists in inquiring into the consequences of the solution *supposed to be found*, by introducing at every step some known truth, such as will produce a more simple consequence, and thus reasoning backwards, so to speak, until at last the answer itself is directly produced in numbers, which was before implicitly involved in the conditions of the problem. The methods are more general than in geometry, that is, a larger number of problems may be solved by each process. The same observations apply still more strongly to the higher parts of algebra, and the differential calculus.

The solution of equations of the first four degrees, and the approximation to that of all higher degrees, render the analytical solution of a vast number of common problems a matter of certainty. The solution of differential equations, where that can be done, is an additional step of even a more important character. Within the last half century, mathematical analysis has made considerable approaches to a state which enables us to determine, almost immediately, whether a problem can be solved by such means as we possess, or not; no small advantage, when it is considered how much time was previously wasted in the attempt to attain results which have since been shown to be impossible.

ANA'LYSIS. Chemical analysis is the separation of compound bodies, either into their simpler or their elementary constituents. When merely the number and nature of these are ascertained, it is termed *qualitative* analysis; but when their proportions also are determined, the analysis is *quantitative*. If the analysis consist only in determining the quantities of the *simpler* constituents of a compound, it is *proximate*, as when carbonate of potash is separated into carbonic acid and potash: but when the operation is extended, and the carbonic acid is resolved into carbon and oxygen, and the potash into potassium and oxygen, the analysis is *ultimate*; for neither carbon, oxygen, nor potassium is divisible into two or more kinds of matter.

ANAMOUR, the antient Anemurium, is the most southern part of Asia Minor, and described by Strabo (p. 669) as the nearest point of the mainland to Cyprus. It is in 36° 2′ N. lat., 32° 50′ E. long. 'Cape Anamour terminates on a high, bluff knob, one side of which is inaccessible; the other has been well fortified by a castle and outworks, placed on the summit, from whence a flanked wall with towers descends to the shore, and separates it from the rest of the promontory.' There are two channels cut in the rock, several miles in length, and on different levels, which supply the castle with water; where they are carried across the ravines, they rest on arches. Here are the remains of two theatres; and beyond the walls a great number of detached tombs, each constructed of two chambers, with arched roofs. No inscriptions were found. The place is now altogether deserted; and the present castle of Anamour is about six miles east of the cape, on the edge of the sea. (Beaufort's *Karamania*.)

ANANASSA, or the PINE APPLE, is a genus of the natural order *Bromeliaceæ*, found wild in the woods of South America, and now commonly cultivated in the gardens of rich Europeans. It is distinguished from the bromelia, to which it was once referred, by its succulent fruit collected in a compact head.

Of *Ananassa sativa*, the common pine-apple, a great number of varieties are known, of which the Moscow and common queen, the black Jamaica, and the Antigua queen are the best for summer use, the Enville and the Trinidad the largest, the black Jamaica the best for winter use, and the blood-red the worst for any purpose or season.

The fruit is a mass of flowers, the calyxes and bracteæ of which are fleshy and grow firmly together into a single head; it is the points of these parts that together form what gardeners call the pips, that is to say, the rhomboidal spaces into which the surface is divided. When wild, pine-apples bear seeds like other plants; but in a state of cultivation, generally owing to the succulence of all the parts, no seeds are produced, and consequently the plants can only be multiplied by suckers, or by their branches, which gardeners call the gills and crown. The latter, which surmounts the fruit, is in reality the end of the branch round which the flowers are arranged, and if it has any tendency to ramification, as sometimes happens, it becomes what is called double. In the island of Penang in the Indian archipelago, there is a sort, all the flowers of which always change into branches, each of which bears a pine, terminated by a crown, so that a great cluster of pine-apples is produced by a single stem; specimens of this sort are called double pines. They have never been produced in England.

The pine-apple was undoubtedly unknown before the discovery of America; its incomparable flavour soon, however, caused it to be introduced into Africa and Asia, where, in a suitable climate, it multiplied so rapidly as to acquire as firm a footing in those countries as their aboriginal plants. In Asia it has even improved so much in quality, that the Burmese pines, which have never yet reached England, are said to be the finest in the world. With this exception it is believed that we already possess the best varieties that exist; and it is undoubted that, except in the kingdom of Burma, the most delicious specimens of the fruit are produced in England. For the probable reasons of this, and the method pursued in the cultivation of the pine-apple in this country, see PINE-APPLE.

ANANI'AS was a son of that Onias, the high priest, who, being exiled from Jerusalem, built a Jewish temple near Heliopolis, in Lower Egypt, and founded the town of Onion on the eastern frontier of the Delta. Ananias and his brother Helcias, or Chelcias, were appointed the commanders of the Egyptian army by Cleopatra, when she warred against her son Lathurus, in the year 102 B.C. Ananias remonstrated against the intention of Cleopatra to seize the dominions of her confederate Alexander Jannæus, and assured her that the Jews would take revenge if she succeeded in killing Jannæus. Cleopatra, considering that Ananias and Jannæus were related to each other, and that many Jews served in her own army, gave up her treacherous plan. (Jost's *Geschichte der Juden*, vol. ii. p. 309—311.)

ANANI'AS (חֲנַנְיָה grace of Jehovah) is the name of several Jews. Ananias, the son of Nebedæus, was high-priest from the year 50-66 after Christ. He was sent to Rome by Quadratus, the governor of Syria, in order to exculpate himself concerning the quarrels of the Jews with the Samaritans; Agrippina interceded for Ananias, and he was set at liberty. He condemned the apostle St. Paul. (See Acts xxii. 23, 24; and xxv. 1.) At the commencement of the Jewish war, Ananias and his brother concealed themselves in an aqueduct, but were discovered and killed.

ANAPÆST, a foot in Greek and Latin metre, consisting of two short syllables followed by a long. It was sometimes called Antidactylus, as being the opposite of the dactyle, which consists of a long syllable followed by two short. Assuming accent in English to be the same thing with quantity in Greek and Latin, the word *témporal* would be an example of a dactyle, and the word *superádd* of an anapæst. From the tendency of English enunciation to carry back the accent towards the beginning of polysyllables, there are not many single words which make anapæsts in our language. But the foot frequently results from the union of two or more words; as in *Dŏ yoŭ heār, Lĕt ălōne*; and sometimes it is found in part of a single word; as, for instance, in the three middle syllables of the word *antĭcĭpātion*. The predominance of dactyles in English, and of anapæsts in French, forms one of the most marked distinctions between the musical character of the one language, and that of the other.

ANAPÆSTIC VERSE, a species of verse composed of a succession of anapæsts. Among the Greeks, the anapæstic verse was freely used both in tragedy and comedy; some forms of it occur very often in Aristophanes. Both in tragedy and comedy, the anapæstic verse admits also dactyles and spondees. In English, only poems of the lighter sort have been usually written in anapæstic verse. Anstey's *New Bath Guide* may be quoted as a well-known example. The line is often reduced to eleven syllables, by the retrenchment of the first, or the substitution at the beginning of an iambus instead of the anapæst. Thus, in the following lines from the work just mentioned,

> 'For I'm told the discourses of persons refined
> Are better than books for improving the mind,
> But a great deal of judgment's required in the skimming
> The polite conversation of sensible women,'

it will be observed, that the first foot of the second line consists only of one short or unaccented syllable followed by a long; and a similar retrenchment might be made of the commencing syllable of any of the others, without spoiling its prosody.

ANAPLI. [See NAUPLIA.]

ANARCHY properly means the entire absence of political government; the condition of a society or collection of human beings inhabiting the same country, who are not subject to a common sovereign. Every society of persons living in a *state of nature* (as it is termed) is in a state of anarchy; whether that state of nature should exist in a society which has never known political rule, as a horde of savages, or should arise in a political society in consequence of resistance on the part of the subjects to the sovereign, by which the person or persons in whom the sovereignty is lodged are forcibly deprived of that power. Such intervals are commonly of short duration; but after most revolutions, by which a violent change of government has been effected, there has been a short period during which there was no person or body of persons who exercised the executive or legislative sovereignty,—that is to say, a period of anarchy.

Anarchy is sometimes used in a transferred or improper sense to signify the condition of a political society, in which, according to the writer or speaker, there has been an undue remissness or supineness of the sovereign, and especially of those who wield the executive sovereignty. In the former sense, anarchy means the state of a society in which there is *no* political government; in its second sense, it means the state of a political society in which there has been a *deficient* exercise of the sovereign power. As an insufficiency of government is likely to lead to no government at all, the term *anarchy* has, by a common exaggeration, been used to signify the small degree, where it properly means the entire absence. [See SOVEREIGNTY.]

ANAS, the duck, a genus of birds under which Linnæus included a great number of species now separated into several genera by recent naturalists; and even Temminck, Drapiez, and others, who adhere to the original Linnæan genus, find it convenient to separate the goose and the swan, and to distinguish the others according as they possess or want a loose membrane covering the hind claw. Illiger ranks the swan with the ducks, from which he separates the goose. Baron Cuvier and Lesson have proposed a great number of subdivisions, and Leach and Fleming have established several new genera. The following are Temminck's characteristics, with some slight modifications:—

The bill of middle size, strong, straight, covered with a thin membrane, and always depressed towards the point, which is rounded, blunt, clawed: margins of the two mandibles toothed with laminæ. Nostrils almost at the surface of the bill, at some distance from the base, somewhat oval, half closed by the flat membrane that lines the nostrils. Legs short, feathered to the knees, drawn back towards the belly; three toes placed before, wholly webbed; hind toe free, and jointed high upon the shank (*tarsus*). Wings of middle size, the first quill either as long as the second, or rather shorter.

ANASTA'SIUS I., Emperor of Constantinople, succeeded Zeno, A.D. 492, through the interest of Ariadne, Zeno's widow, who afterwards married him. Anastasius was then sixty years of age. He was called *Silentiarius*, because he had been one of the officers whose duty it was to maintain peace and silence within the precincts of the imperial palace. Longinus, Zeno's brother, who aspired to the throne, was sent to Alexandria, where he took priest's orders. The beginning of Anastasius' reign was favourable; he abolished several obnoxious taxes, and checked the abuse introduced by Zeno, of selling the public offices to the highest bidder. He also encouraged men of letters, and was himself a man of some learning. Theodoricus, king of the Goths, who, after defeating Odoacer, had made himself master of all Italy, sent an embassy to Anastasius, who recognised his title to the kingdom of Italy, and sent him the purple in token of it. But their good understanding did not last long. Theodoricus invaded part of Illyria and Mœsia, and defeated the Greek troops near the river Margus, now the Morava in Servia. Anastasius, on his side, sent a fleet and army which ravaged the coast of Italy as far as Tarentum, in 508.

Anastasius became obnoxious, on account of his avarice, to the people of Constantinople, who pulled down his statues and dragged them through the streets; and he was himself assailed with a shower of stones while in the Circus, and with some difficulty saved his life. To add to his misfortunes, the empire was attacked by the Bulgarians, the Arabs, and the Persians. The Persians invaded Armenia, and took the town of Amida or Diarbekr on the Tigris, but were defeated by Justinus, who afterwards became emperor. A truce was concluded between Anastasius and Cabades, king of Persia, which lasted twenty years. Anastasius, like many other Byzantine emperors, had the vanity of appearing as a theologian, and of meddling in religious controversies. This nearly cost him his crown; his attempt to introduce some changes in the liturgy occasioned tumults at Constantinople, attended by fires and bloodshed. Several provinces also revolted, and raised to the command one Vitalianus, a Scythian, who advanced to the gates of Constantinople, and Anastasius only obtained peace on condition of becoming reconciled to the church. He had involved himself in disputes with Pope Symmachus, for defending the memory of Acacius, the late Patriarch of Constantinople, who had been excommunicated by Pope Felix II., under the reign of the Emperor Zeno. The Council of Calchedon having declared the Bishop of Constantinople to be next in place to him of Rome, Acacius had contested this decree, and had endeavoured to assert his own precedence, which became a source of schism between the two sees. Anastasius' religious principles, however, seem to have been very unsteady, and he was even accused of favouring Manicheism. Anastasius died suddenly, in 518, at a very advanced age, and was succeeded by Justinus I.

ANASTASIUS II., Emperor of Constantinople. His original name was Artemius, while he was secretary to the Emperor Philippicus Bardanes. After the deposition of Philippicus in 713, he was proclaimed emperor, and sent a new exarch to Italy, and declared himself a follower of the Western church. Constantinople being threatened by the Saracens, Anastasius, to effect a diversion, sent a large fleet with an army to Alexandria, but the troops revolted on arriving at Rhodes, and returned to Constantinople, where they proclaimed emperor one Theodosius, a receiver of the taxes, who, however, alarmed at his dangerous promotion, ran away from them. The insurgents plundered and burnt part of the city, and Anastasius having retired to Nicæa, in Bithynia, was defeated and obliged to surrender, with permission to retire to a convent, and to become a monk. Theodosius III. was then proclaimed emperor in 716, but being unequal to the task, he resigned the crown the following year to Leo, called the Isaurian. Anastasius, from his convent at Thessalonica, made an attempt to recover the throne, and having obtained assistance from the Bulgarians, appeared before Constantinople. Leo, however, bribed the chiefs of the Bulgarians, who delivered Anastasius into his hands. Anastasius was beheaded with several of his followers, and their property confiscated by Leo, in 719.

ANASTASIUS I., Pope, a native of Rome, succeeded Siricus about the year 398. He was a contemporary of St. Jerome, who speaks highly of his probity and apostolic zeal. He condemned the doctrine of Origen, and he also expelled Rufinus from the communion of the church. The latter wrote an Apology which is found in Constant's collection of the *Epistles of the Popes.* Anastasius died in 402, and was succeeded by Innocent I.

ANASTASIUS II., a native of Rome, succeeded Gelasius I. in 496. He endeavoured to put an end to the schism then existing between the see of Constantinople and that of Rome about the question of precedence. He also wrote a congratulatory letter to Clovis, king of the Franks, on his conversion to Christianity. He died, after a short pontificate, in 498.

ANASTASIUS III., likewise a Roman, succeeded Sergius III. in 911, and died the following year.

ANASTASIUS IV., Cardinal Conrad, Bishop of Sabina, was elected Pope in 1153, after the death of Eugenius III. Rome was then in a very disturbed state, owing to the schism of Arnaldo of Brescia and his followers. Anastasius died in 1154, and was succeeded by Adrian IV.

ANASTOM'OSIS, from ἀνὰ, *through*, and στόμα, *a mouth*, signifies the communication of blood-vessels with each other by the opening of the one into the other. The blood-vessels are the tubes by which the different parts of the body are supplied with nourishment. If the blood-vessels destined to nourish a part be obstructed so that it cannot receive a due supply of blood, that part must necessarily die, or, as it is technically termed, mortify. But the blood-vessels are soft compressible tubes, liable, by innumerable circumstances, to have their sides brought so closely into contact as to prevent the flow of a single particle of blood through them. In order to prevent the consequences that would result to the system from the operation of causes thus tending to impede the circulation, provision is made for the freest possible communication between the main trunks of the blood-vessels and their branches, and between one branch and another. It will be shown hereafter [see Aorta] that all the arteries of the body spring from one great trunk which issues from the heart, and which passes from the heart through the chest, into the abdomen, where it divides into large branches which supply the lower extremities. In this course this vessel gives off innumerable branches, which supply different parts of the body, and these branches form innumerable unions with other branches which proceed from the main trunk of the artery. All the branches which form such communications are called *anastomosing* branches, and this union of branch with branch is termed *anastomosis.* Now so numerous are these anastomosing branches, and so competent are they to carry on the circulation, that if the main trunk of the aorta be tied in the abdomen, or even in the chest, the lower extremities will receive a sufficient supply of blood to maintain their vitality through these collateral or anastomosing branches. The knowledge of this fact enables the modern surgeon to perform with ease and safety operations which the surgeon of former times would have pronounced impossible. Anastomosis is of two kinds, that between large trunks, and that between small branches. When the communication is direct between two large trunks, there is no difficulty in conceiving that the circulation may readily go on though one of the trunks be obstructed, because the trunk which remains open may transmit a sufficient quantity of blood to nourish the part to which it is destined. But when a limb is supplied by one large artery only, and when that is obstructed, how does the limb receive a sufficient quantity of blood to support it? Suppose there is an obstacle to the free passage of the blood through its usual channel, namely, the main artery of the limb. What is the consequence? —the blood is driven in greater quantity, and with greater force into those branches which spring from the main artery above the seat of the obstruction. These branches, in consequence of receiving a greater influx of blood than usual, gradually enlarge in diameter, and transmit through them a proportionally larger quantity of blood. At the same time, the more minute branches, which anastomose with the branches given off below the obstruction; are in like manner dilated and admit a correspondingly free passage of blood to the inferior part of the limb. At first the circulation is in this manner carried on through a congeries of minute anastomosing arteries, but in a short time a few of these channels become more enlarged than the rest: as these increase in size, the smaller vessels gradually collapse, and thus ultimately a few large communications constitute permanent channels through which the blood is transmitted to the parts which it is destined to supply. Such is the beautiful provision established in every part of the body to secure to it a due supply of blood, if any obstacle should obstruct the course of this vital fluid through its accustomed channel.

ANA'THEMA, a Greek word, properly signifying, a thing set apart and devoted. Among the Greeks a piece of armour or anything else which was offered to the gods, and placed in a temple, was called an ἀνάθημα, (*anathêma,*) or offering. Tripods, votive tablets with inscriptions, such as may be seen in the Elgin collection of the British Museum, numbered 209 to 218, belong to the class of *anathêmata.* But the dedication or setting apart might be to the powers of evil as well as to those of good, or, according to Pagan notions, to the infernal as well as to the celestial gods. Hence the word came, in one of its applications, to signify much the same thing with the word accursed. It is thus that it is principally used in the New Testament. In this sense the form *anáthema* (ἀνάθημα) was employed, and not *anathéma*, though both are really the same word. In the decrees of popes and councils, also, a common form of expression is, whosoever shall do, or not do, or believe, or not believe, a particular act or dogma, 'let him be anathema,' that is, let him be held excommunicated, separated from the society of the faithful, and branded with the curse of the church. On the other hand, a heretic, when he renounced his errors and was received into the bosom of the church, was accustomed to declare his heresy 'anathema,' or a thing accursed. In English we more frequently use the term anathema in the sense of the curse or severe denunciation itself than for the object of the curse; as when we speak of the church directing its anathema against any particular opinion.

ANA'TIDÆ (*Leach*), the duck kind, a group formed by Dr. Leach to include his genera formed from the great genus *Anas* of Linnæus, and comprehending Oidemia, Somateria, Clangula, Nyroca, Tadorna, Spathulea, Querquedula, Anas, Cygnus, and Anser. Lesson professes himself to be at a loss to apply properly these British generic names. He himself gives, as what he terms subgenera, Maceranas, Macroramphus, Hydrobates, Histrionicus, Platypus, Fuligula, Micropterus, Clypeata, Tadorna, Moschatus, Anas, Anseranas, and Querquedula.

ANATO'LIA, or **NATO'LIA**, is a geographical term now generally considered as synonymous in extent with Asia Minor. It is derived from the Greek ἀνατολή, (*anátole*,) the 'east,' or the 'part where the sun rises,' and, in this respect, may be compared with the French term 'Levant,' which is used to express generally the countries bordering on the eastern shores of the Mediterranean. The word Anatolia, as a geographical term, originated under the Greek empire, and referred to the country which lay east of the seat of government. Anatolia or Anadoli, in a more restricted sense, is used to indicate that tract of country which stretches along the western and a large portion of the northern shores of Asia Minor. Adopting such a restriction, geographers divide Asia Minor into three unequal parts, Anadoli already mentioned, Karamania on the south-east, and Roum to the north-east. But Captain Beaufort, who surveyed the southern coast of Asia Minor, remarks, that however convenient as a geographical distinction, the term 'Karamania is neither used by the present inhabitants, nor is it recognised by the government.' The Pasha of Anadoli (Anatolia) has military jurisdiction over all authorities within the barrier of the Euphrates. Anatolia, taken, then, in its extended sense, represents the whole territory contained within 36° and 42° N. lat., and 26° and 40° E. long. It is bounded on the north by the Black Sea, on the west by the Ægean, or Archipelago, and on the south by the Mediterranean; its eastern frontier extends to the Euphrates and Armenia.

If we were to attempt to name a natural boundary on the east for this portion of the earth's surface, which should be somewhat in accordance with the received notions as to its political limits, we might consider it as commencing at Cape Hynzyr on the Gulf of Scanderoon, and running between N.E. and N.N.E. along the mountain range of Amanus to the neighbourhood of Malatieh near the Euphrates, and up that river to the point (about 40° N. lat.) where the Euphrates, from a course due east and west, takes a course to the S.W. From this point a line drawn along the meridian of 40°, and striking the Black Sea about twenty-five miles east of Trebizond, might be considered as completing the eastern boundary. But no *real* physical boundary exists in the northern part of the peninsula of Asia Minor, for the high plateaus and mountains which belong to the peninsula stretch eastward into Armenia.

The term Asia Minor is one of comparatively recent date: it was unknown to Greek, and, we believe, Roman geographers, at least under the early emperors; nor do we know when the term first came into use. It is, however, now pretty well established, and is the most commonly received term for denoting that extensive country of a peninsular form, the limits of which we have just attempted to define. From a notion early prevalent and long-continued, that the distance from the Gulf of Scanderoon on the south coast to the neighbourhood of Amisus (Samsun) on the north was much less than it really is,—arose a vague idea of Asia Minor (as we understand the term) being a kind of insulated mass from the rest of the continent. The *Euphrates running* along its eastern frontier for so considerable a distance from north to south, favoured this notion. Herodotus reckons Asia Minor among one of his Actæ. [See ACTIUM and ASIA.] From the coast of mountainous Cilicia to Sinope on the Euxine, he assigned a breadth of only five days' journey for a stout pedestrian. The real breadth of the narrowest part, which is considerably less than the true breadth of the line described by Herodotus, is somewhat more than 300 English miles, reckoning from the gulf of Issus to Fatsah, west of Cerasus, on the Black Sea. The width assigned by Eratosthenes, 3000 stadia, is very near the truth: Pliny, with his usual inaccuracy, gives it 200 Roman miles, about 100 short of the mark. D'Anville, in his *Map of Asia Minor*, made the Isthmus too narrow by a whole degree, or about seventy miles, which consequently led to error in his positions all through the interior of the country, and compelled him to make amends for this loss of space by pushing the limits of the peninsula too far to the east. (See Major Rennell's *Treatise on the Comparative Geography of Western Asia*, vol. i.) Major Rennell says that the peninsula of Asia Minor is about one-sixteenth less than the peninsula including Spain and Portugal: the eastern limit of Asia Minor, adopted by Major Rennell, is the line of 300 miles between the Gulf of Issus and the Black Sea.

Asia Minor was known to the later Greeks under the divisions of Mysia, Lydia, and Caria, occupying the western shores. Those of Lycia, Pamphylia with Pisidia, and Cilicia, to which Lycaonia was sometimes added, bounded it to the south, and on the north coast were Bithynia, Paphlagonia, and Pontus. The elevated plains of the interior presented to the east Cappadocia, extending over the mountains to the borders of the Euphrates; and Phrygia on the west, bounded towards the sea by Mysia, Lydia, and Caria. Adjoining these two great internal divisions to the north was Galatia, a division of later date than the rest, having originated in the Gallic invasion, B.C. 278. Its chief town was Ancyra. This province in fact arose from the dismemberment of parts of Phrygia and Cappadocia. The Greeks established colonies and built towns on all the three coasts of the Peninsula, but their occupation was most complete and continuous on the west side. Here we find, lying from north to south, the districts of Æolis, Ionia, and the little Dorian confederation in the S.W. angle of Caria. The several antient political divisions are briefly noticed under the separate heads.

By the Romans this country was sometimes divided into Asia within and Asia beyond Taurus. Our imperfect knowledge of the country prevents us from placing any reliance upon statements of the divisions in existence under the present government. The Turks are represented to have parcelled out this territory into pashalics under seven general heads, confounding all the antient distinctions. This account is taken from Malte Brun, who makes the statement on the authority of a Turkish geographer, a MS. translation of whose work, without date, is preserved in the Royal Library at Paris. The following are his divisions:—1. the Pashalic of Anadouhly, (Anatolia,) extending over Mysia, Lydia, Phrygia Proper, Lycia, Caria, Pamphylia, Pisidia, the larger part of Galatia, and Paphlagonia; 2. the Pashalic of Siwas, (Sebaste,) containing Eastern Galatia, and the upper part of Pontus; 3. the Pashalic of Tarabozan, (Trebisond,) being Cappadocian Pontus and southern Colchis. Hadgi-Khalfah, the geographer, mentioned above, considers this pashalic as a dependence on Armenia. 4. The Pashalic of Konieh, (Iconium,) containing Central and Western Cappadocia, Lycaonia, and Isauria; 5. the Pashalic of Merasche, (Merash,) bordering on Syria, and containing Commagene, Cataonia, and part of Cilicia; 6. the Pashalic of Adana, being Cilicia Proper; 7. the Mousselimlik of Cyprus, held of the Grand Vizier, being an appanage of his office. The work in question is of antient date, and no mention is made in it of the feudatory possessions of Chapwan Oglu and Kara Osman Oglu, so long the delight of their people, and the protectors of European travellers. Before the Greek revolution, important changes had occurred in the general administration of Anatolia. These great feudatories had been swept from their possessions by the Sultan, jealous at the success and vigour of their sway; and since that event, Smyrna and Ionia have been elevated into a pashalic. The following divisions are given by Balbi as those now constituting the divisions or eyalets of Asia Minor: Anadoli, Adana, Caramania, Marach, Sivas, and Trebizond.

Asia Minor, though the seat of early civilization, and still containing numerous traces of former prosperity, is a country very little known. The southern coast was surveyed by Captain Beaufort, who commenced at Yedy Booroon or the Seven Capes, just to the west of the river Xanthus in Lycia, in July 1811. The survey was continued along the coast to Ayas, (Ægæ) in the gulf of Scanderoon, and was unfortunately interrupted before that interesting bay could be examined, owing to the commanding officer being disabled by a treacherous assault of some vagabonds from the mountains. The west coast from the entrance of the Dardanelles to the point where Captain Beaufort's operations commenced is not yet so accurately laid down; but Captain Copeland, who has finished his survey of the coast of Macedonia, is now engaged on the west coast of Asia Minor, and, perhaps, may have an opportunity of peeping into the Dardanelles. There is a Spanish survey of the Dardanelles, of the sea of Marmara, and the channel of Constantinople, with some additions made by the Hydrographical Office of the British Admiralty; and the north coast of Asia Minor is laid down from French and Russian surveys, (the French survey by Captain Gauttier,) but not with that minuteness that is still desirable.

The southern coast, as far as it was surveyed by Captain Beaufort, presents an irregular outline, formed by two huge semicircular sweeps presenting their convex side to the sea, and by two other bold sweeps with their convex side running into the land. There is, however, no deep gulf or bay with the exception of that of Issus or Scanderoon, which runs up between Asia Minor and Syria. Few coasts present so bold a front to the sea. From the gulf of Glaucus to the extensive plain which opens behind Adalia, an almost uninterrupted mass of lofty mountains presses near the shore, and sometimes, as at the Climax, forms the immediate boundary of the waves. From the mouth of the Eurymedon to the peninsula of Cape Cavaliere there is a series of bold promontories; and in some parts bare rocky hills form the coast, as between Selinty and Anamour, backed by lofty mountains. Near the eastern extremity of the coast surveyed, the wide plains of the level Cilicia open on the sea, commencing near the city of Soli, and extending some distance along the N.W. coast of the Gulf of Issus. There are very few and inconsiderable islands on this coast, and the same is true of the northern coast: the reason will be apparent when we come to consider the direction of the principal mountain ranges of the peninsula.

The western coast of the peninsula presents as jagged and irregular an outline as almost any coast in the world, and in many respects very much resembles the opposite shore of Greece. Deep bays with bold projecting peninsulas, and islands which are continuations of the adjacent promontories of the main-land, characterize this coast. Though it has few rivers with a large volume of water, the courses of the Mæander, the Caystrus, the Hermus, and the Caicus, which exceed those of the southern slope, (with the exception, perhaps, of the rivers which water the eastern Cilician plain,) and their general direction from west to east, show that they lie in the longitudinal valleys, whose mountain barriers extend to the coast of the Archipelago. The channel of the Dardanelles, the antient Hellespontus, separates Europe from Asia by a strait about forty miles long, and at its narrowest part not more than one mile broad. The wider opening of the Propontis or Sea of Marmara, about 140 miles long, (taking the longest line,) and 45 broad in the widest part, is succeeded by the narrow channel of Constantinople, (14 miles long,) which unites the Sea of Marmara and the Black Sea. The coast of the Black Sea presents no very deep indentations or bays; and though the mountains are never very far removed from the shore, a considerable extent of coast from the entrance of the Black Sea along the shore of Bithynia is comparatively low; but as we advance eastward, we find the high lands near the shore, and the depth of water as marked on the charts very great. From Cape Karempi (Carambis) for some distance eastward, the coast is marked as high; and from the neighbourhood of Sinub (Sinope) as far as the town of Samsun (Amisus) it has the same general character. From the mouth of the Yeshil Ermak to Cape Yasoun, a distance of 70 miles, the coast is low; the remainder, as far as Trebizond, is more elevated, though as far as we know, not lined with such high cliffs and rocks as characterize some other parts of the coast.

As the great mountain ranges on the north and south sides of the peninsula have a general direction corresponding to that of the coasts, and as the rivers on all the three sides of the peninsula enter the sea at right angles to the general coast line, it follows that the valleys of the streams that enter the sea on the north and south must be of a very different character from those of the Mæander and the Hermus, which enter the sea on the west. But few streams on the southern coast traverse any considerable ranges of hills, and, perhaps, none penetrate from the north side of the great barrier of Taurus to the Mediterranean. The Pyramus (Jihoon) passes by a deep cleft through the mountain barrier (Strabo calls it Taurus: *Casaub.* p. 536) which unites the range of Amanus with the range of Taurus, after it has taken its great turn to the north. According to the description of Strabo, an eye-witness, this must be one of the most magnificent mountain-passes in the world. On the north side some considerable rivers intersect the mountain-chains, forming deep gorges and narrow transverse valleys that give this country quite a different appearance from that of the western side of the peninsula. Such is the gorge in which Amasia, the birth-place of Strabo, stands, on the Iris (Yeshil Ermak).

The grand characteristic features of the geography of Asia Minor are the vast ranges of mountains which traverse it; two chains detached from the plateau of Armenia, one, the more southern, the Anti-Taurus of the antients, the other, the Paryadres, known by the modern name of Tcheldir, or Keldir, unite probably near Kesariah, in the knot of Mount Argæus, now called Argis-Dagh. Covered on its summit by perpetual snows, this circumstance must determine in so low a latitude the elevation of this mountain to be from 9,000 to 10,000 feet. The southern chain, which is, in fact, the Taurus, in its most definite sense, detaching itself from Mount Argæus and the Anti-Taurus, first takes a southerly direction to the neighbourhood where the Pylæ Ciliciæ (the mountain pass of Cilicia) are situated. It then runs in a general westerly direction, but in an irregular line like the coast; and, as far as we can form a conjecture, terminates in the peninsulas of Cnidus and Halicarnassus, forming the southern boundary of the valley of the Mæander. The highest part of the Taurus seems, however, to take a southern course along the west side of the valley of Adalia; and its bold summits press close on the whole coast of the antient Lycia, and perhaps nearly fill the interior. Strabo traces the range of Taurus as far as the coast of the mainland opposite to Rhodes. The mountain above Phaselis, called Takhtalu, the antient Solyma, is 7800 feet high; but some summits in the interior must be still higher, for while Takhtalu, in August, had but a few streaks of snow on its peak, 'many of the distant mountains in the interior were completely white for a fourth part of the way down their sides.' (Beaufort's *Karamania.*)

This range of Taurus is the great southern wall which is the boundary of the high lands in the interior: its steep side is on the south. A branch, the Sultan-Dagh, detaches itself from the main mass in about 37° 40′ N. lat., and near the lake of Egerder: it turns to the N. and N.W., where it is the Paroreius of Strabo, and continuing a westerly course, forms by one branch the northern boundary of the Mæander valley, under the antient name of Messogis. The range of Tmolus, which lies between the Hermus and Caystrus, appears to detach itself from the Messogis at the head of the valley of the Caystrus. Along the northern part of the peninsula we find mountain ranges, of considerable elevation, extending eastward from the Hellespont into Armenia. Though there is doubtless more than one range, or, at least, smaller ranges bordering on the chief one, and running in this direction, still we trace the great mountain line from west to east under the antient names of Ida and Temnon in Mysia, Olympus in the neighbourhood of Brusa, and eastwards, where the Sangarius makes its way through it. As the range approaches the Halys it had the name of Olgassys, now Ulguz-Dagh. Strabo appears to give the name of Olgassys to a parallel range farther north than the continuous chain of the Olympus, which is the Olgassys of Ptolemy, and runs in the direction from Osmanjik to Amasia. From Amasia the range is continued to Trebizond, and is consequently, during the greater part of its course, at some distance from the sea, between which and the main range there are plains and hills, but no high mountains. This range east of Amasia is entirely omitted in some maps.

Major Rennell considers that the northern and southern ranges are connected by a western range, 'the ridge named in modern geography Morad, which connects by an oblique course from N.W. to S.E. Mount Olympus with Taurus, and at the same time separates the waters of the Sangarius from those of the Mæander and Hermus.' But this western range, if we are to understand by it a continuous chain, appears not to exist. The interior of Asia Minor between the great southern wall and the northern barrier which we have described, is, no doubt, intersected by numerous chains, which, however, have in general a westerly direction, though they are no doubt often connected by offsets in a transverse direction. The Morad of Major Rennell can be considered as nothing more than the general line, along which we may trace the decline of the central plateaus towards the west; and the high points in it would appear to belong to the central mountains which prolong their course on a base of less elevation to terminate in the promontories and headlands of the western shore. The mountain *Tamouedj*, seen by various travellers from Olympus in a southerly direction, is apparently a knot formed by the angular junction of the western mass of Temnon with the more eastern system of Olympus.

The centre of Asia Minor is an immense plateau supported by the ranges of mountains which we have described. Part of it is drained by the rivers that flow into the Black Sea; but an extensive tract, bounded by the great barrier of Taurus to the south, is covered with salt marshes, lakes, and rivers, possessing no visible outlet. This plateau is about 250 miles long from N. and E. to S. and W., and 150 miles broad. The chain of lakes is described as extending from the neighbourhood of Synnada (38° 50′ N. lat., 31° E. long.) to the Tyanitis, which lies at the foot of the Cilician Taurus, at the point where it turns to the north. In rainy seasons these lakes overflow, and, Leake says, would entirely submerge 200 miles of land, were it not for the ridges that traverse the plains and separate them into basins. He further states, 'that these basins form themselves into three principal recipients, having no communication, unless it be in most extraordinary seasons.' These are, 1. Kara-Hissár and Ak-Shehr; 2. that of Ilgún and Ladik; 3. that of Konieh, receiving the overflowing of Sidyshehr and Beyshehr; 4. the basin lying between the Cicilian Taurus on the south-east, and the opposite Cappadocian mountains on the north-west now called Hassan-Dagh. To these we may add the basin or basins west of the Sultan-Dagh range, the Paroreius of Strabo, which contain the large lakes of Egerder, and Burdoor (the antient Ascania, which is very salt), and numerous other small lakes. Under any other government these inundations would produce most abundant harvests; but they now run nearly to waste in watering pastures. The salt lake of Tuzla, the Tatta of Strabo, is one of the most curious features of Asia Minor; it is 30 miles in length, and furnishes with that useful article a vast tract of country. Strabo says, that anything immersed was soon covered by the saline incrustations, and birds were unable to fly if they dipped their wings into it. Leake tells us, 'that Sultan Murad IV. made a causeway across the lake, on the occasion of his army marching to take Bagdad from the Persians.' Consequently it must be extremely shallow, and subject to excessive evaporation during the summer and autumn heats. The salt lakes of this high plateau, which borders on the great range of Taurus, are found at intervals from the meridian of 30° to beyond 34°, and on both sides of the parallel of 38° for, perhaps, sixty or seventy miles. They appear to belong to the basins of the high lands, which admit no outlet. The formation of the elevated regions of Asia Minor was known to Strabo, who being a native of the peninsula and personally acquainted with many parts, might have left us a description more complete than any modern has had the opportunity of making, if accuracy of detail and of observation had always characterised his writings. But exactness of geographical description is, from the nature of the subject, not easily attainable, and appears still to wait for improvement from more exact observation and a better nomenclature. 'The mountain plains (ὀροπέδια) of Lycaonia,' says Strabo (p. 568), 'are cold, without trees, and serve as pasture for the wild ass.'

The rivers of Asia Minor have more celebrity than importance. The most considerable flow into the Black Sea. The Halys, now the Kizil-Ermak, is described as taking its rise by two branches in the higher ranges of the Taurus, in Cappadocia. These two main branches, after flowing through more than three degrees of longitude, unite about 39° 10′ N. lat. from which point the course of the river northward is exceedingly irregular. It falls into the Black Sea by one mouth, according to a French authority, at the boundary of Pontus and Paphlagonia. Tournefort describes it to be at its mouth about the width of the Seine at Paris. The whole course is probably not less than 400 miles. The Halys is the most western of the peninsular rivers which flow from the highest level of the interior; and as in the case of the large rivers of this portion of Asia Minor, its numerous branches unite before it descends to the lowest level, through which it appears to flow in a single channel. Its upper streams run in longitudinal valleys, and, we believe, should be represented differently from what they are in our common maps: this will be briefly discussed under the head of HALYS. The Halys is the largest river of Asia Minor; it formed once the boundary between the Lydian and the Median empires, and was considered by the early Greeks as a kind of natural dividing line of the peninsula. It might, perhaps, seem fanciful to derive its name from the Greek word for *salt*, (ἅλς; see Strabo, 546;) but we can hardly help believing that the name is descriptive, and was first given by the Greeks to its upper waters which border on the salt plains. It runs near salt tracts also in the middle part of its course. The modern Turkish name, Kizil-Ermak, means the Red River, but its true name is said to be *Aito-*[illegible].

The Iris, now the Yeshil-Ermak, rises probably on the north side of the Paryadres, but its remotest sources are still doubtful. It runs past Tocat, and thence in a general north direction in a deep valley to Amasiah, the birth-place of Strabo. A few miles below Amasiah it is joined by the river of Kara Hissar, the Lycus of Strabo: the united stream flows through a lower country and enters the Black Sea about 15 miles east of Samsun (Amisus). The plain of Themiscyra, the fabled abode of the Amazons, was also watered by the Thermodon, now the Tarmeh; its origin and its course are not well known, but its length is abridged in some maps most marvellously and incorrectly. West of the Halys, the Parthenius or Bartin, once the boundary of Bithynia and Paphlagonia in the lower part of its course, does not appear to traverse the great mountain barrier of the northern side of the peninsula. Its outlet is a little to the west of the antient Amastris.

The Sangarius, now the Sakaria, is a large river. It is said to be formed by two chief branches: the Ailah, or S.E. branch is formed by various streams, one of which is the river of Angora. The Ailah joins the S.W. branch, the antient Thymbrius, about 39° 50′ N. lat. 31° E. long., and taking first a N.W. and then a N. course, flows into the Euxine through a part of the great 'Sea of Trees,' which runs east towards Boli. The Sangarius with the Halys and the Iris are probably the only three rivers between Trebizond and the entrance of the Dardanelles whose sources are in the high central plateaus, and whose courses traverse the northern mountain boundary of the high lands. The other streams that flow into the Euxine are almost countless in number, but their sources are in the lower and subordinate parallel ranges that lie to the north of the Olympus and its eastern prolongation, and consequently their courses are short and their volume of water inconsiderable. The streams which enter the sea of Marmara from the range of Olympus and its western prolongation appear to us to be exaggerated in most maps.

The rivers that flow into the Archipelago have been already alluded to as running in valleys of a different character from those of the Euxine. The four chief rivers, going from north to south, are the Caicus, Hermus, Caystrus, and Mæander; they run through valleys almost unrivalled for beauty and fertility. Two of these, the Hermus and the Mæander, probably originate in the western extremity of the central plateaus, but the upper streams of the Mæander are by no means yet satisfactorily described.

The rivers of the southern coast have necessarily short courses, though the volume of water brought down from the mountains is sometimes very considerable, and carries with it such quantities of sand and small stones as to have produced apparently very considerable changes in the embouchures of these rivers. The Eurymedon, which is 420 feet wide at its mouth, has a curved bar across the entrance with only one foot water on it, though inside the bar there are fifteen. The Calycadnus, the modern Ghiuk Sooyoo, brings down a prodigious quantity of matter, which at the outlet of the stream being acted on by the current from the east, has formed a large projecting deposit to the west of the river's mouth. Between the mouth of the Cydnus and the

Sihoon (the antient Sarus), which are near one another, similar changes have taken place.

The Pyramus rolls down a continued volume of sand and earth, and is described by Captain Beaufort of the width of only 490 feet at its mouth. Almost all the rivers of Asia Minor make these deposits; and bars and external banks being allowed to form, the character of the coast is often affected. In this way alterations occur in the relative positions of places, which puzzle geographers in their attempts to reconcile differences.

In the survey of Captain Beaufort, we have every evidence of the former grandeur of this southern country, of the extent and magnificence of its cities, and of the number and excellence of its bays and harbours. So changed and degraded are its people in these days, that their existence now presents only a scene of listless inactivity. During the winter they reside on the coast; in summer many of them retire to the mountains. They frequently lead a course of lawless violence in open opposition to the Porte, and are described as especially suspicious and inhospitable to Europeans.

A most remarkable feature of Asia Minor is its fresh and salt water lakes. The whole country being formed by parallel ranges between the Mediterranean and the opposite Euxine, and these being often connected by transverse chains, cut up the country into an immense number of longitudinal valleys, deep gorges, high plateaus, and lower basins. The salt lakes, as we have remarked, appear to belong to the higher levels of the south, the centre, and the south-east. Bithynia, the region of the fresh-water lakes, contains five large and beautiful lakes besides smaller pieces of water; of these the Ascanius (to be distinguished from a southern lake of the same name already mentioned) is the most beautiful: at its eastern extremity stands Nicæa, or Isnik, celebrated in ecclesiastical history for its great council.

A few remarks are necessary on the existing roads in the interior of Asia Minor; but no road in the European acceptation of the term has ever existed of their own construction in the empire of the Turks. Asia Minor still presents remains of the Roman lines of communication; and of the Roman bridges many yet are in use. Relays of post-horses are still maintained by the Turks at distant intervals. They are principally stationed at the large towns of the leading routes. The most frequented road is that from Smyrna to Constantinople, and the only one by which there is a regular communication, except by caravans. Important as is the trade between these great cities and the rest of Europe, this correspondence takes place but twice a month, and is managed by the Austrian mission and consulate, which, as well as the Russian, despatch, at stated periods, a post to the European capitals. The Porte keeps in constant employment a corps of Tatar couriers, by means of whom they make all their communications. On a smaller scale every pasha has a similar establishment. The route from Smyrna to Constantinople passes over the rugged tops of the Sipylus to Magnesia at the foot of the mountains. Proceeding across the valley of the Hermus, the Tatars pass within sight of Thyatira to the east. This is a considerable place, and contains a large Greek population. Its size is about that of Magnesia. Much cotton is grown in the neighbourhood. The valley of the Caicus is then crossed; the direction of the course being constantly north with a slight bearing eastward. The country displays a remarkably bold outline and every capability of fertility, though little favoured by the hand of man. The land journey terminates at Moukalitsh, whence the traveller embarks on the Macestus, or at Moudania, the port of Brusa, according to the circumstances of the weather. This journey is never performed wholly by land, except during the prevalence of the northerly gales in winter, as the distance is increased a third by proceeding round the Gulph of Nicomedia. In Turkey, the traveller is frequently astonished amidst the general desolation at the extreme care manifested in keeping up the tanks and fountains, stationed at convenient distances. The burial places are always planted with cypresses, and frequently exhibit more of care and art than the habitations of the living. Both the khans, where travellers are received, and the mosques, but too frequently betoken the ruined state of the country. No caravans travel from Smyrna to Constantinople, the sea being the cheapest mode of conveying goods.

Of the routes traversing Asia Minor from north to south, that from Constantinople to the southern pashalics proceeds from Moudania to Brusa, already mentioned, and by its beautiful and fertile territory across the range of Olympus, to Kutaya, formerly Kotyæum on the Thymbrius, the residence of the beylerbey of Anatolia, the highest authority of Asia Minor. The city stands at the foot of the Poorsac-dagh, in a cluster of mountains, bounded by a fertile plain to the south. It is a large place, and though not so flourishing as formerly, still contains 50,000 or 60,000 people, of whom 10,000 are Armenians carrying on a profitable trade, and about half that number Greeks. Kinneir, between Kutaya and Konieh, visited AFIUM-KARA-HISSAR. Another route, entirely by land, leads from Constantinople to Konieh, through Isnik (Nicæa) and Eski-Shehr, (Dorylæum) a town of little importance, watered by the Thymbrius, and now, as formerly, known for its natural hot baths. The two lines join at Kutaya. Konieh, the antient Iconium, the seat of government of a pasha of three tails, was the residence of the sultans of the Seljukian dynasty. It contains about 30,000 inhabitants, and has little or no trade, the territory being much neglected. To the east are extensive marshes. The plain of Konieh is considered the largest in Asia Minor, and according to Leake, presents an uninterrupted level of the finest soil, quite uncultivated, except in the immediate neighbourhood of some widely-dispersed villages. 'Another characteristic of these Asiatic plains,' he says, 'is the exactness of the levels, and the peculiarity of their extending without any previous slope to the foot of the mountains, which rise from them like lofty islands out of the surface of the ocean. Proceeding to the chain of Taurus, Leake passed Karamán, a poor, and greatly reduced town, and ascended the mountains in the direction of Mout (Claudiopolis), a place wretched in itself, with a yet more wretched population, though governed by a pasha of two tails. It appeared to this traveller, that the highest mountain near the pass must have a height of between 6000 and 7000 feet. Thence the route led down to Gulnar, or Celenderis, in Cilicia Tracheia.

Another route, advancing in the same direction from the Bosporus, at Eski-shehr pursues an exact eastern course, and reaches Angora, through a country everywhere infested with tribes of Turcomans. Angora (Ancyra) is the capital of Galatia. It is situated on an elevated plain, famed for its fruit, and produces goat-hair nearly as fine as silk, which is made into camlet. Angora has fallen from its importance as a place of trade. Pococke, an old traveller, calls its population 100,000. Kinneir states it at 20,000. Both accounts may possibly have been true, for such a change is a probable consequence of the misery of Turkish rule. Kinneir tells us, that the valuable Angora goat is only to be found within the boundary of Wulli-khan, to the west, and the Halys, to the east. It immediately deteriorates on leaving this district. The territory to the S. E. of Angora, is covered with Turcoman encampments. These people pay no tribute to the Porte, which is without power to enforce it, or to rid the country of them. From Angora, Kinneir proceeded to Ooscat, the capital of Chapwan Oglu, then a place of importance, and of considerable population, but now probably, since the destruction of the family, in utter ruin. Hence a route leads past Kesariah to the celebrated pass of the Taurus, known to the antients as the Pylæ Ciliciæ, where the Romans had a military station, to protect the position. But the regular road to these defiles from the Bosporus, and the north-west of Asia Minor, is much more direct than by Kesariah. Having reached Angora, it proceeds in a course far to the west of the other line, and passes the great chain of Hassan-Dagh. The Cilician defiles are described as extremely difficult, ranging, according to Kinneir, for some distance at a width only of from 50 to 200 yards. The country, in descending to Tarsus, is cultivated, and produces wheat and barley. Here the Tatar couriers embark for Egypt and the coast of Syria. By the route leading entirely overland from Constantinople to Kesariah, by Iznikmid, Angora, and Kir-Shehr, the great caravan, which is annually formed at Scutari, proceeds to the east for the purpose of taking the pilgrims of the capital to the birth-place and tomb of their prophet at Mecca and Medina. From Smyrna, two great trading lines proceed. The caravans frequenting the first, march in a direction due east to Allah-Shehr, (Philadelphia,) at the northern base of Tmolus. This town has a population of from 15,000 to 20,000. Hence they proceed by Afium-Kara-Hissar, to Konieh, carrying the manufactures of Europe and colonial produce into the heart of the country. From Philadelphia, a route proceeds across the Ak-Dagh, or White Mountains, (the antient Messogis) to Adalia, on the Pamphylian sea. It passes by Hierapolis. The town is a mass of grand ruins; and Arundel tells us 'that the road up to it is at the eastern end a petrifaction, overlooking many green spots, once vineyards and gardens, separated by partitions of the same material.'

The other line of trade, direct south of Smyrna, crosses the valley of the Caystrus, and proceeds to Guzel-Hissar, the antient Tralles, a large and important place in the rich and fertile valley of the Mæander. Seated in such a district, this town could not fail to have a large population. Though subject to malaria in autumn, it is supposed to contain from 30,000 to 40,000 people. The trade consists chiefly of cotton, corn, and fruit. Thence the route proceeds to Melaso (Mylasa), famous for its produce of tobacco, amongst the best grown in Turkey. Taking a south-eastern direction here, this line ends at Patara in Lycia. Since the commencement of the Greek war, all the trade of the western and southern shores of Asia Minor has, of necessity, been conducted by the internal lines of communication; the sea having been literally swept by the cruisers and pirates of all the small vessels engaged in commerce. Other roads besides those mentioned have at various times been followed by traders and travellers. One route follows the valley of the Mæander, and continues along the north side of Taurus and through the lake countries to Konieh, which is a great central point towards which the routes leading to the Pylæ Cilicia necessarily tend. The route usually followed by travellers in going from Upper Persia or Armenia to Constantinople is, through Kara-Hissar, Tocat, Amasiah, Osmanjik, the forests west of Boli, (see Morier's *Travels*, p. 358,) across the Sangarius to Isnikmid, the antient Nicomedia, and thence to Scutari opposite Constantinople. The miseries of civil war and the dread of piracy being unknown on the shores of the Black Sea, they may be safely navigated by small vessels during more than six months of the year, and this facility of water-carriage bestows comparative prosperity on the north of Asia Minor.

No general description would convey a correct idea of the climate of Asia Minor, which presents probably more varieties than the peninsula of Spain and Portugal, with which we have compared it as to extent of surface. The comparison may be carried farther. In the numerous chains of lofty mountains which traverse them, in their high plateaus, and in the diversity of climate depending on the configuration of surface, there is a considerable resemblance between the two countries. The climate of both is also materially affected by the adjacent seas. The western shores of Asia Minor occupied by the Greek colonies, and known by the antient names of Æolis and Ionia, have been celebrated in all ages for their genial climate, and for the fertility of their valleys. The summers here, as generally through Asia Minor, are hot, and especially where the local situation does not allow the passage of a free current of air. Smyrna, owing to its situation, is never considered a healthy place. But even on the west coast severe cold is occasionally felt in winter, and neither the southern latitude nor the proximity of the Ægean can overcome the effect of the immense masses of high land which lie to the north in Europe, and to the east in Asia. The snowy peaks of Taurus continue even to the valley of the Mæander on the south side. The high plains of the interior are described as excessively cold in the winter season, though of their absolute elevation no certain statements appear to exist. The contrasts sometimes exhibited between the high regions and the adjacent lower valleys are such as characterise all countries which have a similar configuration of surface. 'At Siwas (Sebaste)', says Fontanier, 'the plague made no great progress, owing to the salubrity of the air, the proximity of the high mountains, and the elevation of the plateau on which the town stands. It is not so at Tocat, where the climate is much warmer, and where the cultivation of silk is carried on, but at Siwas they are obliged to import fruits and grapes, which will not grow there.' Yet Tocat is only twenty hours' journey N.N.W. of Siwas, and though it lies in a deep valley of the Iris, is still considerably elevated above the shores of the Black Sea.

The general effect of great elevation upon vegetable productions, even in southern latitudes, and the application of this principle to the physical structure of Asia Minor, were well known to Strabo. 'It is not at all surprising that the elevated and mountainous parts of these countries (he is speaking of Bactriana and Aria) are cold; for even in southern climates mountains are cold, and in general all elevated surfaces are cold, even if they be plains. Accordingly the parts of Cappadocia on the Euxine are much farther north than those bordering on the Taurus: but Bagadania, a great plain which lies between Mount Argæus and Taurus, has hardly any fruit trees, though it is farther south than the borders of the Euxine by 3000 stadia. The vicinity of Sinope, Amisus, and Phanarœa, on the contrary, for the most part, allow the culture of the olive.' (Casaub. p. 73.) Strabo is mistaken about the 3000 stadia: the distance is not so much.

The northern shore of Asia Minor being exceedingly humid, parts of the mountain slope, from the edge of the high plains, are covered with magnificent forest trees of a great variety. The forests, stretching west from Boli, the great and almost inexhaustible source of supply to the Turkish navy, contain ash, elm, plane, poplar, larch, and beech, and some oaks of large size. (Morier, p. 359.) It is known to the Turks by the significant name of *Agatch Degnis*, or Sea of Trees. Major Rennell assigns to this forest a length of 120 miles from west to east, and forty in breadth. The Sangarius passes through the western part of it, and the southern extends into the limits of the antient Galatia. Few parts of the world present, within the same limits, more striking contrasts than the 'sea of trees,' and the high levels of Lycaonia, which Strabo characterizes by the expressive terms of 'cold and bare.'

The coast of the Euxine and the valleys of the northern side of the peninsula are probably the finest part of Asia Minor. On the south, the immense mass of Taurus, rising like a wall, and in parts capped with eternal snow, leaves between the Mediterranean and its basis a comparatively narrow slip, and gives to the climate of the southern coast, combined with its geographical position, a character very different from that of the north side of the peninsula. The amount of rain is much less, and the summer heat of the coast is often excessive. Unlike the northern shore, which appears to be well supplied with ever-flowing rivulets, some portions of the Lycian shore, where the mountains press close on the sea, have no water from April to November, but what they can keep in reservoirs. The winter torrents cease with the rains. (Beaufort's *Karamania.*) The mountains of Karamania are in general well wooded, and Alexandria is mainly supplied with fuel from them. The timber of this coast, at least that near the shore, is mainly pine, but not in general of large dimensions. The mountains of Taurus contain a great variety of forest trees and shrubs. (Leake, 107.)

This country has, no doubt, at some period, been the seat of violent volcanic action, though perhaps not within the limits of authentic history. Volcanic products are abundant in the peninsula; and the Greek name Κατακεκαυμένη or burnt, which was applied to the district on the confines of Lydia and Phrygia, preserved, perhaps, the only historical record of those great physical revolutions. The western part of Asia Minor has also often experienced most destructive earthquakes, which have not only shaken the country from Sardes to the valley of the Mæander, but also the neighbouring island of Cos. (See Thucyd. viii. 41.) The country in which the earthquakes were most violent in antient times is the same which Strabo describes (p. 578) as the Burnt Region; of the country near the Mæander, he says in his usual obscure manner—'nearly the whole district of the Mæander is liable to earthquakes, and is burrowed under by channels full of fire and water as far as the interior of the country.' The whole western part of Asia Minor is full of thermal springs; they are found also at Brusa near the range of Olympus.

Of the rocks of this peninsula we possess but little information from travellers, though, perhaps, no country in the world would better repay the labours of a skilful observer. The great interior range of Taurus has never yet been examined, and our knowledge of the mountains generally of this peninsula, so rich in minerals and striking phenomena, is extremely scanty. From Captain Beaufort's survey of the southern coast, we learn that, from Patara to Cape Cavaliere, where the high rocks of the coast nearly terminate, a limestone formation shows itself at almost every point. The rivers also are loaded with calcareous sediment, and, like the streams of other countries where limestone prevails, are found unfit for drinking. The bold limestone cliffs are generally of a white colour; those of Cavaliere, of white marble, rise perpendicularly from the sea to the altitude of six and seven hundred feet, and show most singular contortions of strata, of which Captain

Beaufort has given a sketch. On the low parts of the shore a breccia, compounded of gravel, sand, and fragments of quartz cemented in a calcareous paste, sometimes presents a hard unyielding beach. The singular effects produced by the rapid deposition of calcareous matter are noticed by Captain Beaufort at a place on the coast called Laara, near the outlet of the river Catarrhactes, and he refers for similar instances to Chandler's description of the petrified cascade at Hierapolis in the valley of the Mæander.

The limestone formation seems to prevail in the high ranges on the north side of Asia Minor; and, according to M. Fontanier, the mountains which bound the east side of the valley of Siwas exhibit calcareous rocks at the base, covered on the south slope by enormous masses of gypsum, in which the rain, by infiltration, hollows out numerous caverns; the waters, loaded with sulphate of lime, run off along the calcareous mass beneath, and, forming a lake in the plain of Siwas, discharge the discoloured streams into the hitherto pure waters of the Kizil Ermak. In the mountains on the route from Kara Hissár to Siwas this traveller observed, between Andras and Tchiftlik, the limestone of the Pyrenees alternating with serpentine; above the older limestone he remarked a more recent formation containing pectens with radii four inches long (p. 138). Between Siwas and Tocat, we remark the prevalence of limestone, though other rocks appear also; and the same may be remarked of the neighbourhood of Amasia. In going on the west route from Amasia, Fontanier remarks between Marcivan and Haggi-Kevi 'a plain of granite:' as the word granite is often rather vaguely used, and as the information does not go beyond what we have stated, it is difficult to know exactly what is meant. Malte-Brun's remark, 'that from the Sangarius to the Halys we meet with nothing but granite rocks,' is absurd, and contrary to well-known facts. In the neighbourhood of Tossia, west of the Halys, and on the route to Constantinople, Fontanier marks his 'secondary limestone and chalk.' The mountains above Boli, the antient Hadrianópolis, which lies farther west on the same route, are of 'a white calcareous material, with veins of black, and susceptible of a fine polish.' (Fontanier.) In fact we may trace the limestones of Asia Minor from the neighbourhood of Trebizond to the island of Marmara, in the sea of the same name, which derives its denomination from its quarries of marble. There is no doubt that Asia Minor presents one of the most extensive deposits of calcareous matter in the world. The marble quarries of Synnada, from which the wealthy Romans imported large blocks to their capital, are in the very centre of the peninsula at the north-western extremity of the basins of the interior lakes.

Asia Minor abounds in mineral wealth, as we know both from antient writers and from its commerce at the present day. The Chalybes, in the north-east angle, near the coast, were known in the earliest ages as the workers of metals; and the same region is still the great mining district of the peninsula. But it is only in the mountains of the northern portions of the peninsula that we are acquainted with the working of mines; nor, as far as we know, do any writers speak of them in the great southern range of Taurus, a region that belongs to the terra incognita of the world. Copper is worked near Trebizond, Siwas, Niksar, Amasia, Samsoun on the Black Sea, and numerous other places. Fontanier mentions a mine also at Maden in Karamania. Lead in combination with silver is found at Gurcoutch, Husseinabad and other places (Fontanier, p. 254); and lead not worked is said to be found near Kara Hissar, which stands on the great eastern branch of the antient Iris. Unieh on the coast east of Samsoun exports rock alum: in the time of Strabo the cinnabar mines of Olgassys were worked, though we believe they are now no longer known; and the gold sands of Pactolus washed down from the range of Tmolus once helped to fill the treasures of the Lydian kings.

The political history of Asia Minor forms a large chapter in the history of the world. Its position on the western frontier of Asia has rendered it the seat of numerous struggles for sovereignty; its extent of sea-coast at one epoch developed its maritime capabilities, and the diversified nature of its surface has in all ages saved many of its inhabitants from the dominion of the conqueror. Herodotus informs us that in his day (between B.C. 488 and 400) this peninsula contained thirty nations (ἔθνεα), which attested the numerous revolutions it had already undergone. Though there might not be thirty peoples essentially distinct in physical character and language, we can have no doubt that conquest and colonization had in the time of Herodotus given this country as varied a population as it now possesses. The Phrygians claimed the highest pretensions to antiquity of any of the inhabitants of Asia Minor; next to them the Lydians, under Crœsus, became the rulers of the country from the Ægean to the Halys, at that time the western boundary of the empire of the Medes. But before the Lydian kingdom attained any strength, Greek colonies from European Greece had occupied a large part of the western coast of the peninsula, and established themselves firmly along this seabord. In course of time the colonies of this nation spread northward along the shores of the Euxine as far as Trapezus, and on the southern coast, though apparently at a later period, as far as the Gulf of Issus. Many of the Greek cities of the interior, whose fine remains we still admire, were not built till after the age of Alexander, and some of them received their greatest embellishment under the Roman emperors. But between the empire of the Lydians and Medes, and the establishment of Greek kingdoms by the successors of Alexander, Asia Minor, which had before been ravaged by barbarians from the east, had to endure for two centuries the yoke of the Persians. The dominion of this nation, originally of nomadic habits, in its form of government, and the unfavourable effects of its political system, very much resembled the Turkish sway in the days of its former vigour; and, indeed, in the present decline of the Turkish power, the parallel may still be continued. The Persians never reduced the mountain tribes of Taurus to obedience, as we see in the case of the Pisidians; nor was their government more than nominal over the tribes of the north-east parts, with whom we become acquainted in the *Anabasis* of Xenophon. Under the Roman dominion, the peninsula attained the most uniform and settled state, and no doubt also the most prosperous condition that it has ever yet enjoyed. The decline of that power, and the feeble sway of the eastern empire, laid open the country to new invasion from the east, and the Mussulmans began to establish themselves in some of the eastern parts of the peninsula, about B.C. 700. When the first crusaders, under Peter the Hermit, landed near Nicæa in 1096, they found the Turks in possession of this part of Asia, and separated from the capital of Alexis only by the waters of the Propontis and the Bosporus. The Turks had then become numerous in Asia Minor, and the population must for some centuries have been gradually undergoing a change. The wild incursions of the crusaders scarcely left a trace behind them in the peninsula; nor could the invasion of the Tatars under Timur, which resulted in the victory of Angora over Bajazet in 1402, and the subsequent capture of Smyrna, produce any permanent effect, though the entrance of so numerous an army must have somewhat modified the population of Asia. The political condition of the country at the present day is as unsettled as ever it was; and within the last year we have seen an army march from the banks of the Nile to the neighbourhood of the Bosporus, and the sultan of Constantinople, in alarm, call in the aid of Russian troops and French diplomacy to stop the progress of the Egyptian arms. The Porte has yielded the Pashalick of Adana, a large part of which is a fertile country, rich in timber, corresponding apparently to the antient Level Cilicia, and with it the command of the mountain-passes, which will henceforward probably be crossed by an invader whenever a convenient opportunity offers. On the north-eastern frontier, the Russian is become the neighbour of the sultan; and thus, both in the European and Asiatic continent, successful revolution on one side, and invasion on the other, have hemmed the once-dreaded Ottoman within much narrower limits.

The principal component parts of the population of Asia Minor at present are, in the towns and villages, Turks, Greeks, Armenians, and Jews. The population that does not belong to the towns is of a nomadic, and probably of a very mixed character; they are generally classed under the denomination of Turcomans, and are sometimes confounded with the Curds, who are really a different people. It is not unlikely, however, that the Curds have spread westward from the mountains of Curdistan proper, and have been mingled with Turks and Turcomans on the west side of the Euphrates as far as Siwas. (For further information on Asia Minor, see Rennel's *Geography of Western Asia, and his Map*; Leake's *Journal of a Tour in Asia Minor*, with the numerous authorities referred to by both; Fontanier, *Voyages en Orient.*)

ANATO'LICO, a town of western Greece, or antient Ætolia. It is built on a rocky island in the midst of the lagoons, or salt-marshes, which form part of the gulf of Mesolunghi, 38° 40′ N. lat. 21° 35′ E. long. It surrendered in March, 1826, to the Egyptian troops under Ibrahim Pasha, and its capture, together with that of the islet of Vassiladi, which was the advanced post of Mesolunghi, contributed to the fall of the latter place, which happened in the following April. The inhabitants of Anatolico, about 2000 in number, were sent free to Arta, in Epirus, and were allowed to take with them such personal property as they could carry. Anatolico belongs now to the new kingdom of Greece. The fishermen of the lagoons of Anatolico use canoes, which they call *monoxyla*, (single pieces of wood,) formed of the hollow trunks of trees.

ANA'TOMY, from a Greek term (ἀνατομή), which literally signifies 'the separation of a thing into parts by cutting;' the term anatomy is used to signify, particularly, dissection, or knowledge acquired by dissection. Anatomy is at once an art and a science; an art, inasmuch as the pursuit of it requires skilful manipulation; and a science, inasmuch as certain general principles are deducible from it. The object of anatomy is to ascertain the structure of organized bodies. Of the two great kingdoms of nature, the inorganic and the organic, it comprehends the whole range of the latter. Like the organized kingdom itself, it forms two divisions, the one including the structure of plants—vegetable anatomy; the other the structure of animals—animal anatomy. Animal anatomy is divided into comparative and human; comparative anatomy includes an account of the structure of all classes of animals, excepting that of man; human anatomy is restricted to an account of the structure of man only. Human anatomy is subdivided into descriptive, general, and pathological. DESCRIPTIVE anatomy comprehends a description of all the various parts or organs of the human body, together with an account of their situation, connexions, and relations, as these circumstances exist in the natural and sound, or, as it is technically termed, the normal condition of the body. The human stomach, for example, is composed of a number of membranes, which are united in a particular manner; a number of blood-vessels which are derived from particular arterial trunks; a number of nerves which proceed from a particular portion of the brain and spinal cord; a number of absorbent vessels and so on · moreover, this organ is always placed in a particular cavity of the body, and is always found to have certain specific connexions or relations with other organs. The anatomy of the human stomach comprehends an account of all the particulars of this kind, which are uniformly found to concur in all human bodies in which the conformation is regular or natural; and so of every other organ of the body: and because such an exposition of the structure of the various organs includes a description of all the circumstances that relate to their organization, it is called *descriptive* anatomy.

After the study of the human body in this mode has been carried to a certain extent, with a certain degree of success, it necessarily gives origin to a second division of the science, that termed GENERAL anatomy. It is found, that many of the circumstances which belong to any one organ, belong at the same time to several organs; and that thus several individual circumstances are common to many organs. Of the membranes, for example, of which it has been stated that the stomach is composed, some are common to it and to the intestines, to the bladder, to the uterus, to the air-passages, and so on. In like manner with respect to any one of these membranes, when its structure is carefully examined, it is found that in many points its organization is exactly similar to that of all other membranes. This view extended leads to further important and interesting results. All the arteries of the body, whatever their situation, size, or office, are found to be composed essentially of the same substances, disposed in nearly the same order and form. All the veins have, in like manner, a structure essentially the same. All the absorbent vessels, all vessels of every kind, all the bones, muscles, and nerves, the whole external covering of the body or the skin, widely as these various structures differ from each other, present no material difference as far as regards the organization of each particular class. Hence various organs of the body are disposed into what are called common systems, and these common systems are said to consist of common substances or tissues. All the vessels, for example, are collected and arranged under one common class, called the vascular system: in like manner, all the bones are collected and arranged under another class, called the osseous system; all the muscles under another, called the muscular system; all the nerves under another, called the nervous system, and so on. The material that enters into the composition of each of these systems consists of a substance of a peculiar nature; but as this substance is more or less generally diffused over the whole body, entering as a constituent element into the various organs, it is termed a common substance, or tissue. What is termed the common cellular tissue, for example, is the substance of which all the membranes and vessels of the body are composed; the muscular tissue is the substance of which all the muscles are composed; the nervous tissue is the substance of which all the nerves are composed and thus, the structure of the body, analysed in this mode, innumerable and complex as the substances appear to be of which it consists, is ultimately reduced to a very few simple materials, by the combination and modification of which all the different animal substances are produced. That part of anatomy which displays those common substances, and which describes all that relates to these differences, analogies, combinations, and so on, is termed GENERAL Anatomy. Descriptive and general anatomy, then, include an account of the structure of the body as it exists in the state of health. But there is no organ of the body, and no tissue which enters into its composition, which is not subject to disease; in consequence of disease, the regular or natural structure of the component substances of the body becomes changed in a great variety of modes. That part of anatomy which displays these diseased or morbid changes, and which describes all the circumstances relating to them, is called PATHOLOGICAL or MORBID Anatomy. We may say then, that descriptive anatomy comprehends an account of all the parts or organs of the body as they exist in the state of health; general anatomy comprehends an account of all the separate substances of which those organs are composed, not as these substances exist combined in organs, but as they form distinct and peculiar substances; pathological anatomy comprehends an account of all the changes of structure produced by disease, whether in individual organs, or in the primitive or common substances of which these organs are composed.

It is obviously impossible to include in a single article a subject so wide as this. However concise the descriptions under each head might be, it would necessarily swell the account to such a length, as to be incompatible with the plan of the present work. We must, therefore, satisfy ourselves with referring to the separate heads under which the topics comprehended in this subject will be treated. In the mean time, we offer a few observations illustrative of the nature and value of the science of anatomy.

1. In the first place, anatomy is the basis of physiology. It is the object of anatomy to ascertain structure; it is the object of physiology to ascertain function. An organ is constructed in such a manner as to fit it to perform a certain action; the action cannot be understood unless the structure be known; and, often, the structure cannot be known without directly leading to a knowledge of the action. Until the art of anatomy began to be cultivated, the science of physiology was without existence. In proportion as anatomy has been practised, physiology has advanced.

2. In the second place, anatomy and physiology are the basis of the science of medicine. Disease, which it is the object of the physician to detect and to cure, is denoted by disordered function; disordered function cannot be understood without a knowledge of healthy function; healthy function cannot be understood without a knowledge of structure; and structure cannot be understood unless it be examined. The organs in which the most important functions have their seat are placed in the interior of the body, and are completely concealed from the view. There are no means of ascertaining their situation and connexion, much less their nature and operation, excepting that of inspecting the interior of the body. As the most important functions have their seat in organs which are placed in the interior of the body, so those internal organs are also the seats of the most frequent and fatal diseases. Consequently, an accurate acquaintance with the situation of these organs is indispensable in order to ascertain the seats of disease;

out as these organs are completely concealed from the view, it follows that their situation cannot be learnt without the study of anatomy. In several regions of the body, organs the most different in structure and function are placed close to each other. Diseases the most diversified, requiring not only not the same, but opposite treatment, may consequently exist in the same region of the body. Without the accurate discrimination of these diseases, it is often impossible to save life ; but the discrimination of these diseases is absolutely impossible without that knowledge which the study of anatomy only can impart.

It has been justly observed, that one consideration, which shows in a striking light the importance of anatomical knowledge in leading to the detection of disease, is, that the seat of pain is often at a distance from the affected organ. In disease of the liver, pain is generally felt at the top of the right shoulder, because a nerve which goes to the liver is united with a nerve which supplies the shoulder. In disease of the lung, there is often no pain in the lung, but much uneasiness at the top of the windpipe. In disease of the hip-joint, there is often no pain in the hip, but severe pain at the knee. In all these cases, the attention is apt to be carried away from the real seat of the malady. Even in the present day, abundance of practitioners apply their remedies to the seat of the pain, wholly ignorant of the true seat of the disease: mistakes of this kind, often fatal, are inevitable without a knowledge of anatomy, while with that knowledge they are scarcely possible.

3. If the knowledge of anatomy be thus obviously important to the physician, it is still more manifest that it must be indispensable to the surgeon. Without a minute and exact knowledge of the structure, situation, and relation of organs, the surgeon cannot proceed a single step in the practice of his art without the most imminent peril. Many opportunities will occur in the course of this work of illustrating this truth; but perhaps the most striking proofs of it are afforded under the heads AMPUTATION, ANEURISM, HÆMORRHAGE, HERNIA, and LITHOTOMY. It has been justly stated, that no one can form an adequate conception but those who have witnessed it, of the confusion and terror occasioned by the sight of a human being from whose body the blood is gushing in torrents, and which none of the spectators are able to relieve. In all such cases, there is one thing proper to be done, the prompt performance of which is generally as certainly successful, as the neglect of it is inevitably fatal. It is impossible to conceive a more terrible situation than that of a medical man who knows not what to do on such an emergency. But the antient surgeons were constantly placed in this situation; and the dread inspired by it retarded the progress of surgery more than all other causes put together. Not only were they prevented through terror from interfering with the most painful and destructive diseases which experience has proved to be capable of safe and easy removal, but in general they were afraid to cut even the most trivial tumour. They never thought of amputating until the limb had mortified, and the dead had separated from the living parts; and being ignorant of the means of stopping hæmorrhage, they were afraid to cut into the living flesh. But surgeons now know that there is one simple and effectual means of stopping hæmorrhage, namely, compression of the bleeding vessel. If pressure be made on the trunk of an artery, though blood be flowing from a thousand branches given off from it, the bleeding will immediately cease. Should the situation of the artery be such as to allow of effectual external pressure, nothing further is requisite; the pressure being applied, the bleeding is staunched at once: should the situation of the vessel place it beyond the reach of external pressure, it is necessary to cut down upon it, and to secure it by the application of a ligature. Parè may be pardoned for supposing that he was led to the discovery of this invaluable remedy by the inspiration of the Deity. By means of it the most formidable operations may be undertaken with the utmost confidence, because the wounded vessels can be secured the moment they are cut: by the same means, the most frightful hæmorrhages may be effectually stopped; and even when the bleeding is so violent as to threaten immediate death, it may often be averted by the simple expedient of placing the finger upon the wounded vessel until there is time to tie it. But it is obvious that none of these expedients can be employed, and that these bleedings can neither be checked at the moment, nor permanently stopped, without such a knowledge of the course of the trunks and branches of vessels, as can be acquired only by the study of anatomy.

The importance of pathological or morbid anatomy will be readily understood. What are called symptoms are signs of disordered functions ; disordered functions are the consequences of irregular or diseased actions; irregular or diseased actions, after they have continued for a certain time, produce a change in the structure of the organs in which they have their seat. Certain disordered actions produce certain specific changes, modified indeed by a great variety of circumstances, which to a considerable extent are ascertainable and ascertained. The medical practitioner, who has an opportunity of comparing the symptom or the external sign, which he observed during life, with the morbid change of structure visible on inspection of the diseased organ after death, learns with exactness what the external sign denotes, that is, what state of the internal organ it expresses. Moreover, the external sign may not have been obtrusive, and yet it may have been present. It is to this comparison of the symptoms of disease during life, with the diseased changes of structure visible in the organs after death, constituting morbid anatomy, that we owe all the exact knowledge of disease which is at present possessed. There is not a single internal malady, the precise nature of which is now known, which has not been brought to light by morbid anatomy. The diseases, the precise nature of which still remains undiscovered, are those, the seats of which there have been few opportunities of inspecting after death, or in which the morbid changes produced in the organs are so slight or transient as hitherto to have eluded detection. Nor is there any probable means by which the true nature of such diseases can ever become better known than that of increasing the facilities of examining the condition of the organs immediately after death. An effectual remedy for a disease may not indeed be discovered when the exact nature of it is ascertained; but the discovery of the exact nature of a disease puts the physician in the right path in searching after the cure, and at all events teaches him what will be useless, and what mischievous. Hence a clearer apprehension of the nature of a disease has always preceded an improved treatment of it. If the plan of the present work admitted of the requisite details, it would be instructive to show how uniformly every exact and certain method of cure has followed and been founded upon that knowledge of disease which has been brought to light by the inspection of the organs after death. Compare, for example, the knowledge which enlightened physicians now have of fever, and the success which attends their treatment of it, with the darkness which rested on this malady, and the inertness or mischievousness of the remedies employed in it only a few years ago. A physician who understands fever, as far as the nature of this malady has been actually elucidated, can tell at the bedside of the sick with astonishing accuracy what internal organs are in a state of diseased action; what the kind of diseased action is in each; what the probable progress of it will be, that is, what morbid change of structure or organic disease it is its natural tendency to produce, and must inevitably produce, if it be allowed to hold on its course without being checked. To this extent his knowledge places the physician in the position in which he would be if the body of his patient were transparent, and he could actually see the processes that are going on in the internal organs. Having this knowledge, he knows with exactness what to attempt by the remedies which he employs: among numberless remedies he knows which to choose as being the best fitted to accomplish the end in view; his remedy being chosen, he knows the proper strength, the proper time, the proper frequency, in a word, the proper mode in which to exhibit it—that is, he knows how to exhibit it in the dose and form the best adapted to the actual condition of the organ which it is his object to relieve. He does not work in the dark. He has a definite purpose to accomplish, and an instrument of known power with which to compass his purpose. He even anticipates events; stops diseased processes at the very commencement; prevents morbid changes of structure, which, if once produced, too often prove incurable. The consequence is, that in a disease which above all others attacks the greatest number of the most important organs, his interference, as far as it has any influence, is conservative; he sees the impending danger and averts it; he protects the vital organs from a shock, which, but for him, would be fatal to them, while the very remedies employed by the ignorant practitioner increase that shock, and concur with the disease in producing death. The great distinction between the enlightened and the ignorant physician is, that the former knows the state of the internal organs, and adapts his remedies to that state; while the latter knows nothing of the morbid processes that are going on, and prescribes for a fancy or a name. Compare, in like manner, the knowledge which enlightened physicians now have of the diseases of childhood, with the obscurity in which the diseases of this period of life were formerly involved. Take, as an example, the knowledge now possessed of the true nature of a malady which used to be exceedingly frequent and almost uniformly fatal among children, namely, water in the brain. A child screamed out suddenly whilst at play. A change was observed in the child's countenance. A physician was sent for in alarm. He found the child restless, irritable, flushed, constantly moving its head on the pillow, the skin hot, and the pulse quick. In a few days the pulse became slow and intermittent; the child from being in a state of constant restlessness, attended with an occasional sudden shriek, fell into stupor; vomiting was often superadded; and in a day or two more, the pulse having become again extremely rapid, the child expired in convulsions. Such is the brief history of the attack, progress, and termination of a malady which used to destroy hundreds of children, and often individual after individual of the same family. But was the history of the disease really thus brief, and its progress really thus rapid? On the contrary, the concourse of symptoms was in fact exceedingly numerous, and their progress remarkably slow. The disease, at the point of time at which the history of it is here taken up, appeared to be seated solely in the head. The head, however, is the last part affected; the brain suffered entirely in consequence of its sympathy with other and distant organs. The disease commences in the abdomen. The child, long before it gave that ominous scream, had been fretful, hot, feverish, either without appetite or with voracious appetite, and those states of the appetite alternating with each other; either with a constipated or a relaxed state of the bowels, and those states also alternating with each other, the stools meantime being always unnatural, and the belly always tumid, hard, and oftentimes tender. These symptoms, because they did not lay the child prostrate upon its bed, were overlooked, or deemed of no consequence. But at last, from the total failure of all the means employed to save the child when the symptoms of brain disease came on, physicians began to take another view of the matter. They availed themselves of every opportunity they could obtain of inspecting the bodies of the children who died of this terrible malady. In the brain they found water indeed, but often only in very small quantity, and sometimes scarcely any; while there were always signs of inflammation, and, in general, signs of recent and active inflammation, in contradistinction to the signs which denote inflammation of a slow or chronic character. On looking farther, they found still more striking appearances of disease in the abdomen; appearances which denoted a disease of a slowly but constantly progressive character—the source of irritation to the whole system—an irritation not perceptibly yet uniformly increasing day by day. The real nature of the malady was now disclosed. The first appearances of disease were observed; the disease was attacked before it had time to be developed; the remedy was applied to the true seat of the malady, the abdomen, and not to the head, which as yet remained unaffected. Under early and judicious treatment, the head thus almost always remained unaffected; and now water of the brain in children is an exceedingly rare disease, hardly ever coming on but in neglected cases of disordered bowels—cases neglected on account of a more than ordinary degree of ignorance or inattention on the part of the mother or the nurse. This is an example of the manner in which an examination of the body, after death, has led to the detection of the true seat and nature of diseases; and it is but one example. A similar account might be given of almost every disease, the seat and nature of which are clearly and certainly understood.

It cannot be necessary to say more in illustration of the necessity of inspecting the body after death. The aversion to the dissection of the human body, which has hitherto prevailed in all ages and nations, is one among the many and grievous evils inflicted on man by superstition. It is the progress of civilization to change this aversion into respect and gratitude. A remarkable proof of this has been recently given by the legislature of our own country. The British legislature had already acquired a bad notoriety among the civilized nations of Europe, for allowing the continuance of a barbarous practice of a barbarous age—for permitting the schools of anatomy to be supplied with subjects for dissection by the odious means of exhumation. At length Scotland first, and afterwards England, gave an appalling lesson to the government of the consequences that sometimes follow its own criminal indifference to the public good. When roused from this lethargy by the appearance of a new species of crime, the possibility of which had been foreseen, and even the probability of the perpetration of which had been predicted, the legislature began to make a provision for the cultivation of anatomy. A part of the public press, conducted by minds base and vulgar, and, therefore, ready to seize occasions for exciting kindred passions, endeavoured to raise a clamour among the people against the purpose of the government. The attempt was a signal failure. Few had been previously aware of the extension of just views on this subject among the mass of the people. There was a profound and universal impression of the usefulness, nay, the indispensable necessity, of anatomy. The destination of his own body to the purpose of public dissection by the philosopher,* was scarcely regarded with wonder by the mechanic or even the labourer, though it excited a feeling of deep respect in both. At this moment there is scarcely a woman in the lowest rank who would not be ashamed to refuse permission to her medical attendant to examine the dead body of her husband or child. We trust enough has been said to show to every woman, of whatever rank, that the institution of such an examination is the paramount duty of the medical man; and to teach her that the practitioner, who is not anxious to avail himself of this means of extending his information and correcting his errors, is either too ignorant to appreciate the value of his best guide in the doubtful and difficult path he has to tread, or too much absorbed in a money-getting art to practise his profession as a science. (See *Use of the Dead to the Living*, by Dr. Southwood Smith; *Lecture delivered over the Remains of Jeremy Bentham, Esq., in the Webb Street School of Anatomy and Medicine*, by the same Author; Cooper's *Dictionary of Practical Surgery*, Art. Hæmorrhage, &c.)

ANA'TOMY, COMPARATIVE. The term 'anatomy,' as we have seen in the preceding article, is chiefly applied to the science which determines the nature and relations of the various organs of the human body. A general term is here used in a restricted sense. On the other hand, when we would express the extension of the science of anatomy to the whole animal creation, we employ the general term with the addition of the word 'comparative.' This anomaly has doubtless proceeded from the circumstance that, till within a very recent period, the study of animal structure was almost exclusively confined to the human subject; and that even zoologists were contented with inquiring into the functions of animals, instead of determining the character of the organs which were connected with those functions. By the term comparative anatomy, then, we understand the science which conveys to us a knowledge of the differences in the structure and organization of the whole animal kingdom in all its classes, orders, and species.

It is evident that a science possessing such an extensive range must be exceedingly imperfect; especially when it is borne in mind that scarcely half a century has elapsed since the first attempts were made to simplify, by systematizing, its almost infinite details. It has, however, made sufficient progress, not only to have furnished the most important aids to the study of human anatomy and physiology, but to have supplied a secure and broad foundation for all zoological knowledge, both as regards existing and extinct races. As the basis of modern zoology, comparative anatomy presents a subject of the highest interest.

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* By a will, dated as far back as the year 1769, Mr. Bentham, then a young man, left his body for public dissection. The reason at that time assigned for this is expressed in the following remarkable words:—'This my will and special request I make, not out of affectation of singularity, but to the intent, and with the desire, that mankind may reap some small benefit in and by my decease, having hitherto had small opportunities to contribute thereto while living.' By a memorandum affixed to this document, it is clear that it had undergone his revision only two months before his death, (June 1832,) and that this part of it was again deliberately and solemnly confirmed. His body he devised to his physician, who was also his disciple and friend, who delivered a public lecture over it; the body was then used in the anatomical school in illustration of a course of lectures to students in anatomy; the skeleton and head, together with several of the organs, are preserved, the two former constituting one of the most beautiful preparations ever made.

Confining ourselves to this point of view, we shall endeavour to exhibit a few very general, and consequently imperfect, notions, of the principles of the science, as they are applied to a systematic arrangement of the animal kingdom.

In its connexion with zoology the universal knowledge of animal structure is properly called comparative; for it is the object of the science to establish those analogies in organization, which are to determine the separation of the vast number of beings that compose the animal kingdom, into classes, orders, and species. Without a knowledge of anatomical structure, at once the most minute and the most extensive, arbitrary distinctions would almost entirely prevail in the classification of species; and if we follow the history of systematic arrangement, we shall find that it began with the rudest and most empirical divisions, and did not assume the precision of a science until a knowledge of the organs, producing certain actions, took the place of the mere observation of the functions of animals without reference to their organs. The most ordinary observation of mankind would enable them to arrange animals into three great classes, according to their faculties of locomotion, and the general character of the place of their movements; and thus all beings would naturally be divided into those which swim in the water, those which fly in the air, and those which only walk on the earth. A more precise investigation would, however, show extreme differences between animals possessing the same sphere of locomotion. For instance, the great external differences of structure and habit would point out, amongst the inhabitants of the air, the necessity of forming two distinct groups, birds and insects; and the same degrees of difference, in terrestrial animals, would divide those which walk from those which creep. This observation of actions became connected with the observation of external organs: it was found that a large group of terrestrial beings might be separated from the rest of the animal world according to the number of their feet—from the birds who possess two feet, the insects who possess six, and the serpents who move without feet—by the name of quadruped, or four-footed. It was thus that the five great classes were established, of quadrupeds, birds, serpents, fishes, and insects.

When zoology assumed the character of a science, and ceased to be only a crude collection of isolated facts, (and this was not attempted before the labours of our own illustrious Ray,) it was gradually perceived that the most important class, that of quadrupeds, was a very unsatisfactory division. A cow was a quadruped, and so was a tortoise; but the one was covered with hair, the other with scales; the one produced its young fully formed and nourished them, the other laid eggs. For some time these contradictions were not reconciled, till science stepped in with the distinction of *viviparous* quadrupeds, and *oviparous* quadrupeds. In the first editions of the *Systema Naturæ*, Linnæus thus divided the animal kingdom: viviparous quadrupeds, birds, amphibia, (since changed for reptiles, and including serpents and oviparous quadrupeds,) fishes, insects, and worms. Nearly twenty years after the system of Linnæus had been given to the world, Brisson, a distinguished French naturalist, separated the cetaceous animals, or whales, from the fishes, and placed them next to the viviparous quadrupeds. He saw the anomaly of classing them with fishes, knowing that they suckled their young, and were in many other important characteristics of organization similar to the highest class in the animal kingdom. Linnæus acknowledged the importance of the distinction, and he even carried the principle farther than Brisson. He rejected the old division of quadruped, which excluded man at one extremity of the scale and the cetacea at the other;—and he adopted the name *mammalia*, which, expressing the mode in which the young of viviparous animals are nourished, makes this great distinction determine the first class of the animal creation.

Up to a certain point, and that reaching to the most important classes of animals, the system of Linnæus, thus amended, was strictly formed upon a view of the great characteristics of anatomical structure. The birds were separated from the mammalia by the evident distinction in their mode of producing and nourishing their young; although the two classes were similar in possessing the heart with two ventricles and two auricles, and having each warm and red blood: the amphibia (or reptiles), respiring by lungs, were separated from the fishes, breathing by gills; although the two classes had each a heart with one ventricle and one auricle, and the blood of each was cold and red. So far the arrangement of Linnæus, with regard to the four highest classes of animals, has been preserved by Cuvier especially, and other naturalists, who have endeavoured strictly to arrange the animal kingdom with reference to the organization of every species. These four classes have been subsequently formed into one great family of *vertebrated* animals; and all the lower classes have been comprised in a second family of *invertebrated.*

When we come to the invertebrated division, we find that the two classes of Linnæus, the insects and the worms, very imperfectly expressed the great differences in the various groups into which so many hundreds and thousands of species might be resolved, when they were viewed with reference to their structure. Cuvier, the most distinguished comparative anatomist that has ever appeared, applied himself to the removal of these omissions and contradictions. He commenced his great task of classifying the invertebrated animals in 1795, and completed his system in 1812. The principle upon which he proceeded was that of seeking some larger and more comprehensive arrangement than that of classes; and he accordingly laid down the following general table of the animal kingdom:—

Four divisions. (*Embranchemens.*)	Vertebrated animal...	(*Vertebrés.*)
	Molluscous animals.	(*Mollusques.*)
	Articulated animals.	(*Articulés.*)
	Radiated animals.	(*Rayonnés.*)

The first division, as we have before mentioned, comprehends the mammalia, birds, reptiles, and fishes of Linnæus. The second comprises those animals with shells that formed a portion of the worms of the old classification. The third includes all the insects of the same classification, and others that were formerly treated as worms; and the fourth, all the animals descending in the scale of being, including the remainder of the chaotic class of worms.

As the classification of Cuvier essentially depends upon organization, it may be desirable, in this place, to present a further Table of the System, in its extension to classes:—

Divisions.	Classes.	Number of Orders.	Examples.
First division.	1. MAMMALIA.	8	Man, Whale.
VERTEBRATA.	2. AVES.	6	Eagle, Duck.
Four classes.	3. REPTILIA.	4	Tortoise, Frog.
Twenty-seven orders.	4. PISCES.	9	Whiting, Lamprey
	1. CEPHALOPODA.	1	Nautilus.
Second division.	2. PTEROPODA.	1	Clio.
MOLLUSCA.	3. GASTEROPODA.	9	Snail, Limpet.
Six classes.	4. ACEPHALA.	2	Oyster.
Fifteen orders.	5. BRACHIOPODA.	1	Lingula.
	6. CIRRHOPODA.	1	Barnacle.
Third division.	1. ANNELIDA.	3	Leech.
ARTICULATA.	2. CRUSTACEA.	7	Crab.
Four classes.	3. ARACHNIDA.	2	Spider.
Twenty-four orders.	4. INSECTA.	12	Beetle, Butterfly.
	1. ECHINODERMA.	2	Starfish.
Fourth division.	2. INTESTINA.	2	Tape-worm.
RADIATA.	3. ACALEPHA.	2	Actinia.
Five classes.	4. POLYPI.	3	Sponge.
Eleven orders.	5. INFUSORIA.	2	Monas.

In attempting to estimate the importance, and to point out the peculiar character, of a system of classification of the animal kingdom founded upon comparative anatomy, it will be impossible for us to enter into any minute details, interesting and instructive as they might be, which have reference to the distinctions of species; but it may be desirable to take a rapid view of the leading principles of the larger zoological arrangements.

The division of *vertebrated* animals is one which very happily marks a chain of affinities, connected with the gradual development of the highest organs and functions. The vertebral column is the necessary foundation of a skeleton: it supports the head; and the canal, which passes from one end of it to the other, incloses the common fasciculus of the nerves, which communicates with the nerves of the cranium. When we descend to the *invertebrated* animals, the skeleton no longer exists; the bony substance is altogether wanting, or is external, instead of internal; and the nervous system assumes an entirely different character, till it is gradually lost in the mere irritability of the lowest classes in the scale of animal life.

The organization of the first class of vertebrated animals,

THE ANIMAL KINGDOM.—ARRANGED ACCORDING TO THE SYSTEM OF CUVIER.

ANIMALS, arranged in Four DIVISIONS, Nineteen CLASSES, and Seventy-seven ORDERS.

DIVISION I.—VERTEBRATA; (Vertebrés,) arranged in Four Classes, and Twenty-seven Orders.	CLASS I. MAMMALIA, (Mammifères,) including Eight Orders.			ORDER I.	Bimana	(Bimanes)	Man.
				.. II.	Quadrumana	(Quadrumanes)	Chimpansee.
				.. III.	Carnivora	(Carnassiers)	Hyæna.
				.. IV.	Rodentia	(Rongeurs)	Rat.
				.. V.	Edentata	(Edentés)	Armadillo.
				.. VI.	Pachyderma	(Pachydermes)	Hog.
				.. VII.	Ruminantia	(Ruminants)	Cow.
				.. VIII.	Cetacea	(Cetacés)	Whale.
	CLASS II. AVES, (Oiseaux, including Six Orders.			.. I.	Rapaces	(Oiseaux de Proie)	Hawk.
				.. II.	Passeres	(Passereaux)	Swallow.
				.. III.	Scansores	(Grimpeurs)	Woodpecker.
				.. IV.	Gallinæ	(Gallinaces)	Cock.
				.. V.	Grallæ	(Echassiers)	Heron.
				.. VI.	Palmipedes	(Palmipèdes)	Duck.
	CLASS III. REPTILIA, (Reptiles,) including Four Orders.			.. I.	Chelonia	(Chéloniens)	Tortoise.
				.. II.	Sauria	(Sauriens)	Lizard.
				.. III.	Ophidia	(Ophidiens)	Snake.
				.. IV.	Batrachia	(Batraciens)	Frog
	CLASS IV. PISCES, (Poissons,) including Two Series.	Series I. Osseous, including 6 Orders.		.. I.	Acanthopterygii	(Acanthoptérygiens)	Sword-fish.
			Malacopterygii. (Malacoptérygiens)	.. II.	Abdominales	(Abdominaux)	Salmon.
				.. III.	Sub-brachiati	(Subrachiens)	Whiting.
				.. IV.	Apodes	(Apodes)	Eel.
				.. V.	Lophobranchii	(Lophobranches)	Hippocampus
				.. VI.	Plectognathi	(Plectognates	Sun-fish.
		Series II. Cartilaginous, or Chondropterygii, including 3 Orders.		.. VII.	Sturiones	(Sturioniens)	Sturgeon.
			Branchiæ fixed.	.. VIII.	Selachii	(Sélaciens)	Ray.
				.. IX.	Cyclostomi	(Cyclostomes, or Suceurs,	Lamprey.
DIVISION II.—MOLLUSCA; (Mollusques,) arranged in Six Classes, and Fifteen Orders.	CLASS I. CEPHALOPODA, (Céphalopodes.)			.. (one)	Cephalopoda	(Cephalopodes)	Nautilus.
	CLASS II. PTEROPODA, (Ptéropodes.)			.. (one)	Pteropoda	(Ptéropodes)	Clio australis.
	CLASS III. GASTEROPODA, (Gastéropodes,) including Nine Orders.			.. I.	Pulmonia	(Pulmonés)	Snail.
				.. II.	Nudibranchia	(Nudibranches)	Glaucus.
				.. III.	Inferobranchia	(Inferobranches)	Linguella.
				.. IV.	Tectibranchia	(Tectibranches)	Bursatella
				.. V.	Heteropoda	(Hétéropodes)	Carinaria.
				.. VI.	Pectinibranchia	(Pectinibranches)	Whelk.
				.. VII.	Tubulibranchia	(Tubulibranches)	Vermetus.
				.. VIII.	Scutibranchia	(Scutibranches)	The Sea-ear
				.. IX.	Cyclobranchia	(Cyclobranches)	Chiton.
	CLASS IV. ACEPHALA, (Acéphales,) including Two Orders.			.. I.	Testacea	(Testaces)	Oyster.
				.. II.	Acephala	(Acéphales sans Coquilles)	Ascidia.
	CLASS V. BRACHIOPODA, (Brachiopodes.)			. (one)	Brachiopoda	(Brachiopodes)	Lingula Anatina.
	CLASS VI. CIRRHOPODA. (Cirrhopodes.)			.. (one)	Cirrhopoda	(Cirrhopodes)	Barnacle.
DIVISION III.—ARTICULATA; (Articulés,) arranged in Four Classes, and Twenty-four Orders.	CLASS I. ANNELIDA, (Annelides,) including Three Orders.			.. I.	Tubicola	(Tubicoles)	Amphitrita.
				.. II.	Dorsibranchia	(Dorsibranches)	Amphinomæ.
				.. III.	Abranchia	(Abranches)	Leech.
	CLASS II. CRUSTACEA, (Crustaces,) divided into 2 Sections.	Section I. Malacostracia, divided into 5 Orders. (Malacostracés.)	Compound eyes placed on pedicles and moveable.	.. I.	Decapoda	(Décapodes)	Gebia Stellata.
				.. II.	Stomapoda	(Stomapodes)	Phyllosoma.
			Eyes sessile and immoveable.	.. III.	Amphipoda	(Amphipodes)	Gammarus.
				.. IV.	Læmodipoda	(Læmodipodes)	Whale-Louse.
				.. V.	Isopoda	(Isopodes)	Auilocra.
		Section II. Entomostracia, divided into 2 Orders. (Entomostracés.)		.. VI.	Branchiopoda	(Branchopodes)	Branchipus (Cancer stagnal
				.. VII.	Pœcilopoda	(Pœcilopodes)	Dichelestium.
	CLASS III. ARACHNIDA, (Arachnides,) including Two Orders.			.. I.	Pulmonata	(Pulmonaires)	Phrynus. (Spider.)
				.. II.	Trachearia	(Trachéennes)	Phalangium.
	CLASS IV. INSECTA, (Insectes,) including Twelve Orders.			.. I.	Myriapoda	(Myriapodes)	Centipede.
				.. II.	Thysanoura	(Thysanoures)	Velvet Spring-tail.
				.. III.	Parasita	(Parasites)	Louse.
				.. IV.	Suctoria	(Suceurs)	Flea.
				.. V.	Coleoptera	(Coléoptères)	Beetle.
				.. VI.	Orthoptera	(Orthoptères)	Grasshopper.
				.. VII.	Hemiptera	(Hémiptères)	Aphis.
				.. VIII.	Neuroptera	(Neuroptères)	Ant-Lion.
				.. IX.	Hymenoptera	(Hyménoptères)	Ichneumon-Fly.
				.. X.	Lepidoptera	(Lepidoptères)	Moth.
				.. XI.	Rhipiptera	(Rhipiptères)	Xenos.
				.. XII.	Diptera	(Diptères)	Gnat.
DIVISION IV.—RADIATA; (Rayonnés,) arranged in Five Classes, and Eleven Orders.	CLASS I. ECHINODERMA, (Echinodermes,) including Two Orders.			.. I.	Pedicellata	(Pédicellés)	Star-fish.
				.. II.	Echinoderma	(Echinodermes, *sans pieds*)	Sipunculus.
	CLASS II. INTESTINA, (Intestinaux,) including Two Orders.			.. I.	Cavitaria	(Cavitaires)	Cerebratula. (Filaria)
				.. II.	Parenchyma	(Parenchymateux)	Planaria cornuta.
	CLASS III. ACALEPHA, (Acalèphes,) including Two Orders.			.. I.	Acalepha (simple)	(Acalèphes, simples)	Medusa.
				.. II.	Hydrostatica	(Hydrostatiques)	Diphyes.
	CLASS IV. POLYPI (Polypes,) including Three Orders,			.. I.	Actinia	(Charnus)	Green Actinea.
				.. II.	Gelatinosa	(Gélatineux)	Cristatella.
				.. III.	Corallina	(à Polypiers)	Coral.
	CLASS V. INFUSORIA, (Infusoires,) including Two Orders.			.. I.	Rotifera	(Rotoferes)	Wheel Animalcule
				.. II.	Homogenea	(Homogènes)	Globe Animalcule.

the mammiferes, (*mammalia,*) presents an articulated skeleton, generally much more perfect than that of the three other classes of the same division. The greater number have four articulated limbs, parts of the skeleton; and all have a diaphragm between the chest and the abdomen; a heart with two ventricles and two auricles; the blood red and warm; lungs filling the cavity of the chest, through which the blood passes in the course of its circulation. These are the only viviparous animals, properly speaking. The distinctions of *orders* amongst the class of mammalia is principally derived from the differences in the character of the limbs and the teeth. The first five orders possess the common character of having nails at the extremities (*Unguiculata*). These animals are therefore possessed, more or less, of the power of seizing upon objects. The first three orders have also the common character of possessing the three sorts of teeth; the canine, the incisive, and the molar. But the first order (*Bimana*, Man) is distinguished by having hands (that is, four fingers and an opposable thumb) upon the anterior extremities only; while the second (*Quadrumana*) have hands at the four extremities; and the third (*Carnivora*) have no opposable thumb upon either extremity. The fourth order (*Rodentia*) have no canine teeth; and the fifth (*Edentata*) no incisive. The hoofed mammalia (*Ungulata*) form two orders, the *Pachyderma*, and the *Ruminantia*. These are unfitted, from the character of their extremities, for seizing upon objects; they employ them only for locomotion. The eighth order (*Cétacea*) have no hind-limbs developed; and their fore-limbs are very short, and flattened into the form of fins, by which they are fitted for an existence in the water, although it is necessary for them to breathe above the surface.

The second class of vertebrated animals (*Birds*) have many parts of their organization similar to the mammalia. They have a heart with two ventricles and two auricles; warm blood; the cavity of the cranium wholly filled with the brain; and the trunk completely formed by ribs. But, on the other hand, they are oviparous; they have no diaphragm; and only the vertebræ of the neck and tail are moveable. The blood of this class passes through the lungs before its distribution to the other parts of the body; but the lungs are not free; they are attached to the ribs; and the external air passes through them in its way to cavities which are dispersed through the body. It is this circumstance which gives them the power of flying, that is, of using their anterior extremities, or wings, which stand in the place of the fore-arms and fore-legs of the mammalia.

The third class of vertebrated animals (*Reptiles*) offer, in their several orders, very considerable differences in their external characters, and their general habits—much more so than either of the preceding classes. Some have the fore-limbs which distinguish the mammalia and birds; others have very imperfect rudiments of them; and in others they are wholly wanting. But they all agree in having but one ventricle to the heart; in the coldness of their blood; and in their imperfect respiration, consequent upon a portion of the blood passing through the lungs.

The fourth class of vertebrated animals (*Fishes*) differ essentially from the preceding classes. The limbs have disappeared, and fins supply their place; the skeleton is, in many species, very incomplete. They breathe by gills, or branchial openings, instead of lungs, and they have consequently neither trachea, larynx, nor voice. The two great divisions of fishes are the bony and the cartilaginous. In some of the latter, the peculiar character derived from the skeleton of the vertebrated animals has almost disappeared.

When we arrive at the second great family of the animal kingdom, the Invertebrated—when we endeavour to classify that vast series of beings, which, possessing no vertebral column, or skeleton, gradually depart more and more from what we consider the type of the highest organization—we are astonished as much by the extreme differences of the organs, faculties, and habits, of particular classes, as by the unbounded variety of the species which those classes contain. It is in this department of the creation that zoologists have encountered the greatest difficulties, especially since they have founded their science upon the distinctions of anatomical structure. At every step of their knowledge they have felt how much they have yet to know. They have, however, established many of the most important principles and facts.

In all this great family of the invertebrated animals, the supports of muscular action are not furnished by the internal parts of the body;—none of the classes or species respire by cellular lungs; none have a voice; and the nervous system, where any exists, has not its middle part inclosed in a cavity of bone. These are the great general distinctions between the vertebrated and invertebrated families. But the distinctions between the three divisions of the invertebrated animals, and the classes even of the same divisions, are so manifold and important, that we cannot attempt to furnish any adequate notion even of the general structure prevailing in each division, and must content ourselves with the most general outline.

The *Molluscous* division (*Mollusques*)—the fleshy bodies clothed with a shell—have a true circulation of the blood through arterial and venous vessels; they respire by branchiæ (gills); they have a brain, and possess a nervous system. Some have the organs of sight and hearing, while others appear to be limited to those of touch and taste. Some masticate their food, others can only swallow.

The *Articulated* division (*Articulés*), although possessing the common character which is indicated by their name, are so different in other important particulars of their organization, that we must briefly point out the leading peculiarities of each class. The *Annelida* have a long body, composed of rings; they are unprovided with articulated feet; they respire by branchiæ; have a system of circulation; and a long, knotted cord connected with the nervous system. The *Crustacea* have the body and the limbs articulated; the outer covering is bony, as their name implies; they have a system of circulation; and they respire by branchiæ. The *Arachnida* (often confounded with insects) respire by narrow tracheæ, and, not undergoing any transformations, have always articulated feet, and eyes in their head. The *Insects* undergo transformations; and have, in their perfect state, two eyes and two antennæ in the head, six articulated feet, and two tracheæ, which extend through all the body.

When we descend to the last division, the *Radiated*, (*Rayonnés*,) we find that some of the organs which appear to be essential to life, as we see them developed in the preceding divisions, do not exist. The nervous system, whether consisting of a spinal cord, or a system of ganglions, totally disappears; the sexual system does not appear to exist; the head, properly so called, is no longer found; and the organ of sight is extinguished. It is unnecessary for us to trace the last degree in the scale of animal life, to that point when the animal kingdom appears to lose itself in the vegetable; and when the investigations of man, however skilfully conducted, are baffled by the minuteness, as well as the number, of the objects which he desires to examine and to register.

As it may be desirable to refer to the general arrangement by Cuvier of the Animal Kingdom, in Divisions, Classes, and Orders, we have given, in the opposite page, a Synoptical View, translated, with some additions, from the table drawn up by M. Achille Comte.

(See Cuvier, *Leçons d'Anatomie Comparée*; Cuvier, *Ossemens Fossiles*; Blumenbach's *Manual*, by Lawrence and Coulson; Lamarck, *Philosophie Zoologique*; Geoffroy St. Hilaire, *Cours de l'Histoire Naturelle des Mammifères*; Home's *Lectures on Comparative Anatomy*.)

ANAXA'GORAS, a philosopher of the Ionic school, born at Clazomenæ, one of the Greek towns of Ionia, in the first year of the seventieth Olympiad, or in B.C. 500, three years before the death of Pythagoras, and ten before the battle of Marathon. Born both to rank and wealth, he had leisure to apply himself to philosophy and astronomy, under the instructions of Anaximenes. In the twentieth year of his age (that of the battle of Salamis) he went to Athens, where he continued thirty years, engaged in the propagation of his philosophical opinions. He numbered among his hearers Pericles, Euripides, Socrates, Archelaus, who succeeded him as head of the school known by the name of Ionic, and some say, Democritus. He obtained the surname of *νοῦς* (the mind). It is said that he was the first who taught the distinction between mind and matter: but this is improbable, unless we understand, the first who taught that doctrine at Athens. Of the persecution which drove him from that city, there are different accounts. One is, that he was accused of being in communication with the Persian king, and condemned to death in his absence; another, that he was banished for his opinions, and starved himself to death at Lampsacus; a third, that he was found guilty of impiety for his opinions respecting the Sun, and condemned to death, but saved by the intercession of Pericles; while Plutarch affirms that Pericles was his only accuser. Montucla, without citing his authority, says it was for an essay on the cause of eclipses that he was condemned. However this may be, he departed from Athens, and lived at Lampsacus on the Hellespont till his death, a period of twenty-two years. He died B.C. 428, aged seventy-two.

No works of Anaxagoras have come down to us, nor any astronomical observations from which we might form an opinion of his knowledge. He regarded the heavens as his country, and expressed himself to that effect when reproached for his indifference to his terrestrial birth-place. He is said even to have abandoned his wealth and honours from his zeal for study. When in prison he wrote a treatise on the Quadrature of the Circle; and he also wrote, according to Vitruvius, on Perspective. He is said to have written a treatise entitled *Actinographia*, which Montucla conjectures to be the last-mentioned work.

Among the various opinions attributed to Anaxagoras are the following: — that all substances are composed each of their proper parts, which are small and capable of infinite divisibility (see Lucretius, i. 830, &c.)—that the stars are stones torn from the earth, and set on fire by the æther which pervades the whole upper part of the universe—that the sun is a burning plate or globe, bigger than the Peloponnesus—that the moon receives light from the sun, (Plato says this opinion is anterior to him,) and has seas, hills, and valleys of her own—that the milky way is the shadow of the earth thrown upon the heavens: others say, he thought it consisted of stars of too feeble light to be seen by day—that the rainbow is caused by the clouds being held before the sun as a mirror—that winds are caused by the sun's heat rarefying the air—that earthquakes are caused by the effort of confined air to ascend—that snow is not white, but black (this opinion of his is reported by Cicero)—that the earth is flat, and that its inclination is the cause of the seasons—that the soul has an aërial body—and that sound and echo are conveyed to us by the air. Montucla protests against many of these opinions being supposed to be those of Anaxagoras, but we cannot see with what reason. That they are given by very various and doubtful authorities is true; but there is nothing so absurd in the opinions themselves, compared with others which we know to have existed at the same time, to warrant us in rejecting any one of them on that ground.

He is said, in the seventy-eighth Olympiad, to have foretold the falling of a large stone at Ægos Potami. [See AEROLITES, p. 151.] Sixty-two years afterwards, the prediction was said to have been fulfilled before the defeat of the Athenians on that spot by Lysander.

ANAXIMANDER, the kinsman, pupil, and successor in the Ionic school, of Thales, was born at Miletus in the third year of the forty-second Olympiad, B.C. 610, and died there (as is supposed) about B.C. 547, aged 63. Little is reported of him, except that he was the first who constructed maps (see Agathemerus, lib. I. cap. i.) and gnomons, one of the latter of which he erected at Sparta; and that he first discovered the obliquity of the ecliptic. The latter is improbable; though, if he were the first who constructed a gnomon, it is probable that he would also be the first who gave anything like a measure of the obliquity. He is said, on the authority of a passage in an ancient history of astronomy cited by Fabricius, to have maintained the motion of the earth; but as most others assert that he placed the earth in the centre of the universe, Montucla plausibly conjectures that the passage κινεῖται περὶ τὸ τοῦ κοσμοῦ μέσον, *moves round the centre of the earth*, should be read κεῖται περὶ, &c., *is placed at*, &c. Some say he thought the earth spherical; others that it had the figure of a drum. At Sparta he is said to have predicted an earthquake which threw down the greater part of the city.

The similarity of the names of Anaximander, Anaximenes, and Anaxagoras, who succeeded each other in the Ionic school, has caused many opinions to be attributed to one which are by others given to another. It is, however, we believe, said of Anaximander alone, that he believed the sun, moon, and stars to be enormous wheels, encompassing and revolving round the earth, each having a round orifice in its circumference out of which fire issued; and that the stoppage of this orifice is the cause of eclipses. The latter part of this opinion is also attributed to Anaximenes.

ANAXI'MENES, the pupil and successor of Anaximander. He was born at Miletus. The years of his birth and death are not known, but he is said to have been alive at the overthrow of Crœsus by Cyrus, B. C. 546. Two epistles of his to Pythagoras are preserved by Diogenes Laertius, the genuineness of which may be questioned, since one of them gives an account of the death of Thales (his countryman and predecessor) very different from that given by Diogenes himself.

The opinions attributed to him are very much like those quoted in ANAXIMANDER and ANAXAGORAS. He held, in addition, that air was the first principle of all things—that the contraction of bodies is what is called cold, and their rarefaction heat. This he illustrated by observing that when we blow forcibly, condensing the air with the lips, it is cold; when with the mouth wide open, so as to allow the air to pass freely, it is warm. This is almost the only thing like an appeal to experiment (except the very doubtful measurement of the obliquity—see ANAXIMANDER) which we can find attributed to any of the successors of Thales; and even in this the philosopher is wholly mistaken. The contraction of bodies, generally speaking, produces heat; and their rarefaction, cold. The case cited is not at all in point.

There is another equally inconclusive illustration of the causes of thunder and lightning. Anaximander concluded that thunder is the noise made by the striking of one cloud by another, and lightning the glare arising from the friction. Anaximenes reinforces this conclusion by the observation, that the sea shines when struck by an oar.

ANBURY and CLUB-ROOT, a sort of galls produced by insects on the roots of cabbages, turnips, holyhocks, and other species of cultivated plants, and popularly, but incorrectly, supposed to arise from peculiarities of soil, or from growing the same crop successively on the same field, or to be owing to variations of seasons. Nothing can be more simple than the disproof of all these theoretical notions. If we take some of the cabbages or turnips, whose roots are infected with anbury, and keep them in garden pots covered over with close gauze, in a short time, if the plants be kept growing, the little weevils, evolved from the grubs in the interior of the roots, will make their appearance, ready to multiply their species, by depositing their eggs, as their parents had done, on the first turnip or cabbage they can find; that is the critical time to destroy them, and prevent their increase. The weevil thus arising continues to be no less, but often more, destructive than the grub had proved to be in feeding on the roots; for it thrusts its beak (*rostrum*) into the seed-leaf of the turnip, and greatly injures the crop. Neither of these insects would ever breed in dung. When the turnip is advanced to the rough leaf, these insects either die, as most insects do, when they have laid their eggs, or betake themselves to some other plant, such as clover, which is suited to their taste.

It will be therefore evident, that no peculiar rotation of crops, nor peculiar manure for dressing the soil, can be of any avail in preventing anbury, or in stopping its progress when the insects have obtained a lodgement within the roots. The destruction of the adult insects before they have laid their eggs, is the only remedy, though in the case of so small a species, it is peculiarly difficult to put in practice.

ANCENIS, a town in France in the department of Loire Inférieure (the Lower Loire). It is a neat, pleasant town, situated on the north bank of the Loire, nearly twenty-two miles N.E. from Nantes, the capital of the department. It trades in corn, wood, fruit, wine, brandy, and vinegar. There is an ancient castle commanding the town, long inhabited by the dukes of Bethune. Ancenis has also a '*college*' (high school), hospital, and barracks for cavalry. Population, 3145 (Malte-Brun); or 4000 (Balbi). The arrondissement of Ancenis contains about 41,000 inhabitants.

ANCHOR (from ἄγκυρα), a heavy iron instrument for fixing a vessel in a harbour or road, thence called an *anchorage*. It consists of a strong bar called the shank, having, at one end, a beam called the stock, which lies flat when at the bottom, with a ring beyond it, to which the cable is attached; it terminates at the other end in two opposite arms at right angles to the stock, to which are attached strong triangular plates, called flukes.

The anchor, which, under some form or other, must have been as antient as vessels of any magnitude, is accordingly mentioned by many Greek and Latin authors, by whom also the invention, like many others, which, from clumsy beginnings, have passed through many stages of improvement, is ascribed to various persons. The first anchors were, most probably, what they are now among uncivilized nations, namely, large stones, or crooked pieces of wood loaded with heavy weights. The Chinese, who may be supposed to adhere to antient forms, are said to use chiefly crooked pieces of heavy wood.

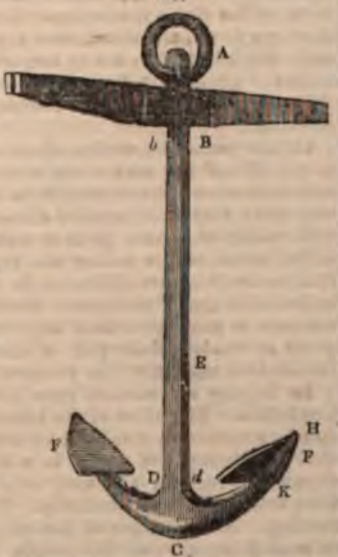
Among the Greeks, the anchor was made latterly of iron. The first anchors had but one fluke; afterwards the other was added: but the anchor was yet without a stock, as appears from antient monuments, and must have been very incomplete till the stock was added, which may, therefore, be considered as the last step towards the present form. Each ship then had several anchors; the chief one was called *ἱερα*, or sacred, and reserved for the last extremity. The custom and its proverbial application have come down to us in the expression 'sheet anchor;' but the veneration paid to its name has much declined since the custom of paying *5l.* to the master on letting it go was discontinued in the navy.

The number of anchors carried at both the bows and stern of a ship have been finally reduced to four principal, and these all at the bows. The anchors supplied to men-of-war are the best and small bowers*, the sheet, and the spare: these are of the largest size; to which are added, the stream and the kedge, which are used for particular or for temporary purposes, and are usually carried 'in board.' Since there is but small difference in the form of anchors of different weights, the stream of a large vessel serves for the bower of a smaller. The several parts of an anchor are shown in *fig.* 1.

The principles of the construction may be considered under two heads,—the purposes the machine is to fulfil, and the nature of the strains to which it is exposed. We will take at once the modern form to exemplify these considerations.

When the anchor is let go from the vessel's side, whether from a horizontal position of the shank (when it is held by the stoppers) or from a vertical position (when held entirely by the cat-stopper), as in *fig.* 1, the heaviest end, or crown, will tend to descend fastest, and the anchor, on having reached the bottom, will, most commonly, fall,—not in the position for holding, but upon the crown and on the end of the stock, because the stock moves with less resistance through the water in the direction of its length than of its breadth. From this position, therefore, the anchor is to be turned over or canted before it can hold. Now, it is evident that, if the stock were very short, the pull of the cable would tend rather to drag the end of the stock along the bottom than to lift up one of the flukes, as must be done in canting the anchor; whereas, if the stock were longer, the cable would act with increased leverage, whatever might be the length of the shank in either case; hence the longer the stock, within the practical limits of stowage, the more certainly will the anchor turn properly, and, when hooked in the ground, the more powerfully will it resist any effort to overset it. Also, it is evident that the anchor will turn the more easily as the arm is shorter. In repairing old anchors, it is common to shorten the shank; in doing this, it is the custom also to shorten the stock in the same proportion. This, which is equivalent, in fact, to lengthening the arms, might, if carried to any extent, prevent the possibility of the anchor turning over, and therefore it appears that when the shank is shortened, the stock should remain unaltered. The amount of force required thus to overturn any given anchor might be found by calculation, or by actual trial; and it is remarked that the result of the former may be diminished by one-seventh when the anchor is under water.

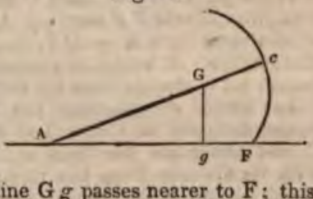
Fig. 1.



A The ring.
B The stock.
B D The shank.
C The crown.
C H The arm.
D, *d* The throat.
E The trend, at one-third of C A.
F Palms or flukes, of equal base and height.
B, *b* The small.
H The bill or peak.†
The end of the shank or A is called the nut.

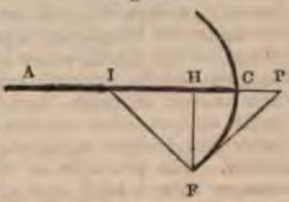
The anchor being in the position of *fig.* 2, its weight, supposed to be collected at the centre of gravity, G, (not including the stock,) tends to force the fluke F into the ground; and this pressure on F will evidently be greater, as the vertical line G *g* passes nearer to F; this pressure is $W.\frac{A\,g}{A\,F}$, (W = the weight, exclusive of the stock). As soon as the cable pulls from A, it causes the fluke to catch or hook deeper, that is, it forces the fluke down; and the position of the fluke should be such as to form the angle most favourable for this purpose.

Fig. 2.



Suppose the arm C F imbedded, or the shank lying along the bottom, and the cable acting in the line C A with a tension *t*; then the pressure on the fluke taking place perpendicular to its surface, draw F I perpendicular to the fluke, and draw F P, tangent to the fluke, meeting A C produced in P; then if P I represent the tension *t* of the cable, I F will be the perpendicular reaction of the fluke, and P F the force which tends to drive it into the ground: draw F H perpendicular to C A, then H F is that part of P F which is perpendicular to the horizon, or is the effort of *t* to sink the fluke: let I P F $=a$, then F P $=t \cos a$, and F H $=$ F P $\sin a = t \cos a \sin a$, which is a maximum when $a = 45°$; or the fluke should be placed at 45° to the shank. Now, it is remarked by seamen, that when an anchor is once started, it is difficult and often impossible to get it to hold again, and as this case is the most urgent of all, it is apparently the one to which the position of the fluke should be calculated.

Fig. 3.



It would appear, since the weight of a large anchor bears a much higher ratio to any given tension of cable than the weight of a smaller one, that the solution of the problem ought to involve the weight of the anchor, which would give a different angle for anchors of different weights; but it appears from numerous experiments which Lieut. Rodger has made on the qualities, as well as on the strength, of anchors, and which it is to be hoped will be made public, that an anchor, when dragged, always tends to rise out of the ground, thus following the direction in which the loosened soil affords a free passage;—since, therefore, it will not sink till it rests, and since its weight becomes less effective in pressing it farther the deeper it sinks, while the tension of the cable remains the same, it is thus constantly tending to the most favourable angle (when = 45°) till the arm is entirely buried.

It appears from *fig.* 2, that in shortening the shank, the fluke, making already in most anchors the angle with the shank, or F P I in *fig.* 3, too great, will become still more nearly perpendicular to the horizon. In many such cases the pull of the cable will produce scarcely any tendency whatever to sink the fluke; besides which it is to be observed that by lessening the horizontal distance A F, while F *g* remains the same, the pressure on the fluke is diminished, and thus on both accounts the qualities of the anchor impaired.

We now come to considerations relative to the strength of the anchor. It is obvious we have not the means of determining the amount of any of the forces concerned, but long experience has marked pretty nearly the limits beyond which the dimensions of anchors need not be carried. With these we can determine satisfactorily the preference which should be given to one form over another.

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* Called formerly bowyers, from being carried at the bows. (Harris's *Lexicon Technicum.*)

† Seamen by custom drop the k in peak and fluke, which they pronounce pea and flue.

The first strain that comes on the anchor when the cable is strained falls on the ring, which had been often broken or straitened, till its dimensions were of late years increased. This pull is conveyed along the shank to the lower arm, which it tends to break off at the greatest distance from the fluke, and therefore the thickness of the arm should increase towards the throat.

The crown, which formerly was a circular arc, of late years formed an angle, till changed by Mr. Pering.

The force to break the arm C F, *Fig.* 3, is the reaction perpendicular to the fluke, or FI, against the tension of the cable. And the moment of this force to break the arm C F at C, is as the perpendicular from C on F I. If the arm F C be straightened into F P meeting A C in P, then the moment of the same force is as P F, which is considerably greater than before. It would be curious, therefore, to know what reason led to change from the curved to the angular form.

In lifting or weighing the anchor, the cable acting perpendicularly to the end of the shank tends to break it, and hence the thickness of the shank should increase with its distance from the ring; also the breadth of the shank should be downwards, and the like holds good of the arms, the chief dimension of which should be in the plane of the cable and shank, thus opposing the greatest strength to the greatest strain. Some foreign anchors reverse this. The cable being thus 'up and down,' the smallest motion of the sea is carried to the anchor, and it is supposed that the chain-cable has thus, from its want of elasticity, frequently broken the anchor. An increased length of shank obviously renders this jerk less sudden and less severe: but increasing the length would require an increase of size or strength of the shank, whose length had already been found too great for the strength necessary in the employment of chain-cables; in order, therefore, to obtain this increase of length without either increase of weight or loss of strength, Lieutenant Rodger constructed his patent hollow-shanked anchor. The principle on which a hollow rod or bar is stronger than a solid one of equal sectional area is well known, but we cannot, within our limits, convey any precise notion of the manner in which the difficulties which attended the application of this principle to the shank of the anchor, were surmounted. An account, with drawings, is given in the *Repertory of Patent Inventions of July*, 1830, in which are given also the results of experiments tried at Hawks and Co.'s manufactory, Newcastle; from these it appears that his anchor broke short-shanked anchors of much greater weight without indicating any distress; and similar superiority has been exhibited on some other occasions.

Since the fluke from its breadth opposes greater resistance to being disturbed in weighing than the arm does, the axis of rotation will be towards the fluke, and accordingly the ground displaced by the angular motion of weighing being less than that displaced by fair pull,—and moreover the fulcrum or axis being near the throat in direct pull,—it seems that the force to lift an anchor out of the ground will be considerably less than the force sufficient by fair pull to bring the anchor home. Besides these strains to which the anchor is exposed by its office, it is liable to accidents; for instance, an anchor let go on a rocky bottom has been found, on heaving it up, to have lost an arm, which was, probably, caused by its striking against a rock obliquely in its descent; and this opinion is corroborated by the case recorded by Mr. Pering, of an anchor broken by swinging from the wharf against the side of the lighter brought to receive it. Again, the shank has been found broken in the middle, though this does not seem to have been accounted for satisfactorily, whether attributed to the chain-cable or to a sudden jerk; and it may here be observed generally, that the anchor descends much more swiftly with a chain-cable than a hemp one, for the stiffness of the hemp opposes a retarding force, while the greater density of the chain adds a continually accelerating force.

The shank and arms were formerly made of iron bars, welded together;—that this was done very imperfectly appears from the fractures in the old anchors. The arms and shank being made separately, were then joined together. A great improvement was made by Mr. Pering, who formed the shank of flat bars, of breadth equal to the depth of the shank, which could be perfectly united. But the greatest of his improvements is considered to be the formation of the arms and part of the shank together, which is done by splitting, or dividing in two, these bars, and throwing the ends back opposite ways for the arms. Over the opening, or angle thus formed, is fixed a truss, and then to this are joined the flukes, and at the other end the remaining part of the shank. The bars are placed with their breadths downwards, thus receiving the strength of the cable in weighing, edgewise; Mr. Rodger places the breadths horizontally, forming the upper and lower halves of the (solid) shank separately, to be united afterwards, in order that the iron may bend rather than break, and with this object the iron is likewise drawn out to make it fibrous.

Various rules have been given for the dimensions of anchors, as, for instance, that the shank should be four-tenths of the main beam (Aubin's *Mar. Dict.*); but it is evident that neither beam nor tonnage relate directly to the magnitude of the anchor, because two similar ships may ride very differently at their anchors. The rough rule in the navy is 1 cwt. to a gun, thus an 80 gun-ship will have an anchor of 80 cwt.; and a merchantman of 200 tons having an anchor 10 cwt., 5 cwt. is added afterwards for every 100 tons; thus 300 tons would give 15 cwt., and so on.

The principal dimensions of the anchors in the navy may be stated shortly thus:—calling the shank 10, the arm is about 3, the breadth and depth of the palm about half this, the thickness or depth at *b*, or the small, ·42, at the throat ·5, which are nearly the dimensions of the arms also, and the breadths about ⅘ of these, the edges being rounded. These general dimensions are taken from Pering's *Treatise*, 1819, since which other alterations have been made, principally in giving the section a diamond or lozenge form.

The weight of an anchor of 10 feet in length is, according to the same authority, about 11·4 cwt., and since, if the forms of all anchors were alike, the weights would be as the cubes of the lengths, the weight of any anchor might be found by multiplying the cube of its length by ·0114. Thus the weight of an anchor of 14 feet in length would be 14 × ·0114 = 31·3 cwt.; the weight of this anchor is, by the table, 30 cwt., hence as far as 30 or 35 cwt., the rule is near enough, but for larger anchors it gives the result too small, because their thickness is made greater in proportion. The weight of the anchor includes that of the ring.

As to the cost of an anchor, the labour per cwt. is about 24*s*. for an anchor of 10 cwt. and under, and for the largest anchors about 3*l*.; the value of an anchor of 95 cwt., including the iron at about 9*s*. 9*d*. per cwt., is about 300*l*.

The stock consists of two beams of oak, bolted and hooped together; the length is that of the shank and half the diameter of the ring; it is square; the side at the middle is an inch to a foot of the shank, and tapers to half of this at the end. Such a stock is nearly one-fourth of the weight of the anchor. Lieutenant Rodger has proposed a solid stock of African oak, for the greater convenience of stocking or unstocking.

Of late years iron stocks, whose weight is from one-fourth to one-fifth of the anchor, have been much used. Whatever convenience may attend them in small vessels, it seems very clear that their smaller diameter and greater weight under water will cause them to sink deeper in a soft bottom in the event of the anchor not turning over at once, and thus render this more difficult to do, especially as their length is limited to that of the shank. Small vessels require heavier anchors in proportion than larger vessels; the sea, sudden gusts of wind, and the pull of the cable affect the larger vessels less, and they thus preserve a steadier strain.

In forging an anchor, care is taken not to render the iron brittle. The effect of the hammer is to harden the surface by contracting it more than the interior. This is remedied by heating the whole to a dark red-heat, which, by expansion, restores the iron to a uniform state, and it is then suffered to cool gradually. This process is called annealing. A large mass of iron requires a very heavy blow to work it equally, or the outside only will be affected by the hammer; the steam-engine is applied for this purpose in Woolwich dock-yard.

Various forms of anchors have been proposed to answer particular ends; these our limits prevent us from entering upon. We have confined ourselves rather to the principles of the machine, which seem to have been very little considered, and have omitted several points. (See the *Ency. Metrop.*, Pering's *Treatise on the Anchor*, &c.)

An anchor is said to be 'foul' when the cable is any way entangled with it; to 'come home,' when the ship drags it; to be 'a-wash,' when the stock is hove up to the surface of the water; to be 'a-cock-bill,' when hanging vertically, as in *fig*. 1.

A'NCHORET, sometimes written, and more correctly, Anachoret, a Greek word, signifying a person who has retired from the world. Under Christianity they sprung up about the middle of the third century in Egypt and Syria, where many believers came to hide themselves in caves and solitary wilds, from the fury of the persecution which arose under the Emperor Decius. Paul, commonly called the hermit, has the credit of having been the first regular anchoret. A distinction, however, came afterwards to be drawn between anchorets and hermits; the former name being given only to those who rigidly confined themselves to their caves or cells, and the latter to those who, although they had broken off all commerce with the world, still wandered about at large in the wilds to which they had retired. Both descriptions of recluse were entirely distinguished from the Cœnobites, or those living in communities. Many of the anchorets were laymen; and there were also female as well as male anchorets. From nearly the commencement of the seventh century, the church assumed a jurisdiction over anchorets; and persons were not allowed to enter upon the mode of life in question except by permission of their ecclesiastical superiors, and after an appointed ceremony had been performed, at which the bishop presided. Churches and religious houses in the middle ages would sometimes keep an anchoret shut up in a cell, which was usually attached to the choir of the church. Such an attraction brought great crowds of the devout and the curious to the holy place, which benefited much by their offerings. It was eventually found necessary, in our own as well as in other countries, to lay down certain regulations with a view of discouraging the adoption of this solitary life. The most singular species of anchorets recorded in the history of the church, is that which arose in Syria in the fifth century, and of which Simeon Stylites was the founder. This zealot and his followers, instead of resorting, according to the customary fashion, to caves, elevated themselves into the air, on lofty pillars of stone, on the tops of which they passed their lives. They have hence received the names of pillar saints, holy birds, and aërial martyrs.

ANCHOVY (*Engraulus*, Cuvier), a genus of abdominal malacopterygious fishes, separated by Baron Cuvier from the *clupeæ* or *herrings* of Linnæus, from which they are distinguished by the superior number of their branchiostegous rays, amounting to twelve or upwards, by the gape of the mouth extending behind the eyes, and by the straight and prolonged form of the superior maxillary bones, which form a small muzzle, projecting considerably beyond the mouth. The genus, as at present constituted, consists of six or seven species, all of diminutive size, and with the exception of the common anchovy (*E. encrasicholus*), and a nearly allied species distinguished from it by M. Cuvier, (*E. meletta*) all inhabitants of the tropical seas of India and America. Whether these latter agree with the European species in the savour and other qualities of the flesh, for which it is so highly esteemed among civilized nations, is a doubtful question; at all events we are not aware that the fishing of the native species has ever been attempted either in America or India.

The common anchovy is a small fish, not much longer than the middle finger, of a bluish brown colour on the back and silvery white on the belly. The anal fin is remarkably short, and the dorsal situated immediately above the ventral; these characters will serve readily to distinguish it from the sprat and other kindred species, with which it might otherwise be confounded, and which are, in fact, not unfrequently imposed upon the public for the real anchovy. It abounds in the Mediterranean along the shores of Spain, Italy, and Greece; in the Atlantic it is found along the coasts of Portugal and France, and occasionally has been taken off the shores of England and Holland. Considerable fisheries of anchovies are established along the coasts of Provence and Catalonia; but the most productive of all is off Gorgona, a small island west of Leghorn. The latter fishery is carried on only during the months of May, June, and July, at which period the anchovies quit the deep seas and approach the shores for the purpose of depositing their roe; it is then only that they are found in the Mediterranean, which they enter in enormous shoals, by the straits of Gibraltar, at the commencement of the breeding season, and leave it, after fulfilling this duty, to retire again to the depths of the Atlantic. They are fished for only during the night, and are attracted round the boats by means of charcoal fires which are kept burning in the sterns. After being caught, the heads, gills, and entrails are separated from the bodies, which are salted and arranged in small barrels, varying from five to twenty pounds in weight: this is the only preparation which they undergo, previously to being sent to market; and if proper means be taken to exclude the air, they will in this state keep for a very considerable period. If, when the barrels are opened, the fish are found to be small and firm, round-backed, with a silvery white skin and red flesh, and a plump, compact form, they are probably the true anchovy: if, on the contrary, they taper very much towards the tail, are of a dark brown colour without, and have flabby pale-coloured flesh, they will probably turn out to be the sardine (*E. meletta*), another Mediterranean species frequently mixed with real anchovies, or even sold separately as the genuine fish.

No condiment is more generally known and esteemed than anchovy sauce. Among the Romans, who called it garum, and prepared it exactly in the same manner as we do at present, its reputation was, if possible, still greater than among modern nations, and it appears to have formed an indispensable article of seasoning in their most expensive and luxurious dishes. The mode of preparing anchovy sauce consists simply in bruising and boiling the fish over a slow fire with melted butter; the action of the heat dissolves the whole body to a jelly, and in this form, when brought to a proper consistence, it is potted or bottled for use. This is the most common form of using the anchovy, but it is also sometimes brought to the breakfast table whole, and is then eaten raw. The importation of anchovies into the port of London is very considerable. Up to the year 1829 the average quantity annually imported amounted to about 100,000lbs. In that year, however, the duty was lowered from a shilling to twopence a pound, in consequence of which the importation of 1830 amounted to 260,000lbs, but declined in the following year, 1831, to about 30,000 lbs.

ANCHOVY PEAR. [See LAURUS.]

ANCHYLO'SIS, a Greek word (ἀγκύλωσις), signifying *a bending*. If the Greek orthography were strictly followed, the word would be written *ankylosis*.

An essential part of the apparatus of locomotion in animals consists of the structure termed a joint. (See JOINT.) Joints are so constructed as to produce various kinds and degrees of motion, in the execution of which it is necessary that the different parts constituting the joint should be in close contact with each other. Organized living surfaces, in close contact with each other, have a tendency to grow together; but such a union would at once destroy the action of a joint, and a specific apparatus is provided for the express purpose of preventing this event. What are termed articular surfaces, that is, the surfaces of joints, are covered with a thin and delicate membrane which secretes a peculiar fluid of an unctuous or oily nature, termed *synovia*. This synovia, the oil of joints, is in general effectual in keeping separate and distinct the different parts of the joint, however closely and for however long a time they may be in contact with each other; nevertheless, it does occasionally happen that a firm and complete union takes place between the different articular surfaces: when this occurs, it constitutes what is technically termed anchylosis, or, in common language, a stiff joint. An anchylosis, or a stiff joint, consists then of the immoveable union of two bones naturally connected together in such a manner as to form a moveable joint. All the moveable bones forming joints may become consolidated together, or anchylosed; and cases are on record of a general anchylosis of all the bones of the human body. Whatever keeps a joint motionless for a long time together may give rise to anchylosis. Hence it is apt to occur after the fracture of a bone in the neighbourhood of a joint; because it is necessary to the cure of the fracture that the limb should be fixed in one position, while the inflammation, occasioned by the violence that produces the fracture, often spreads to the joint, and it is one of the ordinary effects of inflammation to agglutinate and consolidate the parts inflamed. Hence inflammation, sprains, dislocation, shocks occasioned by leaping or falling on the feet from great heights, ulcers, are the common causes of anchylosis. But anchylosis cannot always be considered in the light of a disease; at any rate, it is sometimes the happy termination of a formidable malady. The natural cure of many painful and dangerous diseases of the joints is the formation of an anchylosis. When an anchylosis is forming, and is clearly inevitable, and is, indeed, a thing to be desired, the position in which the limb is kept, or the position in which the bones are allowed to unite, is a matter of great importance to the future comfort of the individual. When, for example, from injury done to the hand, the joints of the fingers are undergoing the process of anchylosis, it is very important to keep the fingers bent, because, if they anchylose in that position, the hand will be more useful than it could be were the fingers permanently extended. On the contrary, when there is danger of anchylosis of the knee-joint, the limb should be kept as straight as possible, because, if the leg be extended, the limb will be more useful than if it were permanently bent. On the other hand, when anchylosis of the elbow-joint cannot be prevented, the limb should always be kept bent. Considerations of this sort are of great importance; they are never neglected by the intelligent surgeon; and they tend to lessen the inconvenience and suffering of an inevitable calamity. They ought in every such case to be presented to the view of the patient, who should be made to understand, as far as possible, the ground on which the plan that may be pursued is adopted, in order that he may co-operate with his medical attendant in lessening the evil that cannot be averted, and in securing whatever advantage it is possible to obtain.

ANCIENT, ANCIENTS; or ANTIENT, ANTIENTS. The term *ancient*, which we derive from the French word *ancien*, has the primary meaning of 'very old,' as when we say 'an ancient building,' 'an ancient family,' implying only that many generations have passed since they first came into existence. But it is also used in a more limited sense, with reference to a certain period in the existence of the human race; as when we speak of ancient, as distinguished from modern, history; of the ancient classics, ancient literature, and generally, of the *ancients*. The boundary line between ancient and modern in this latter sense is not very accurately drawn; but according to the vulgar acceptation of the terms, the period of the ancients seems to be closed by the final and complete overthrow of the western Roman empire. With reference to the nations over which that empire extended, the distinction is not altogether arbitrary, or without an intelligible reason. The overthrow of the Roman empire marks the commencement of a new order of things, when we begin to discover the rudiments of those powerful independent nations, of those various languages, and peculiar institutions, which so remarkably distinguish a large portion of what is called modern Europe, from Europe under Roman dominion. There is of course a short interval, which may be considered as doubtful ground, for the possession of which the terms ancient and modern will always be allowed to contend.

It is plain that the reason here given for the commonly received distinction is applicable only to the west and south of Europe; yet the same distinguishing terms are familiarly used, and in many cases the same date arbitrarily assumed with reference to the rest of the world. This practice is attended with many difficulties, and produces no little confusion. The eastern Roman empire, for instance, survived the western by many centuries; nor can any good reason be given why the subjects of Justinian and his predecessors should be classed among the ancients, and those of his successors among the moderns. If the question were asked, where should a Greek author in a late period of the eastern empire be placed, we could not call him either an ancient or modern Greek writer without giving cause for considerable misapprehension. In the case of the oriental nations, the same terms are still applied, and often perhaps with no very distinct notion of their import, even by those who employ them. We hear commonly of ancient and modern Persia, ancient and modern India. Now, in the case of the Persian empire, in seeking for a date, we might choose between the conquests of Alexander the Great, the irruption of the Parthians, the restoration, as it is called, of the old Persian dynasty, and its subjugation by the Mohammedans. Any one of these events, and especially the last, would furnish perhaps better ground for the distinction of ancient and modern Persia, than any thing which occurred at the time of the overthrow of the Roman empire.

It might be expected that the convenience of having at hand such terms as ancient and modern would often lead to some abuse, and this is particularly observable in the vague reference so frequently made to 'the ancients.' There is no definition which excludes from their number any who lived from the time of Noah down to the last Roman emperor; and it is obvious, that there is not much which can be safely predicated of a class so large and comprehensive, yet we often hear of what 'the ancients' said, and did, and thought. Allusion is made to the military tactics or the philosophy of the ancients; comparisons are instituted between the literature of the ancients and moderns; and we are told of the sentiments on certain subjects entertained by the heathen ancients. The truth is that, by 'the ancients,' we must understand, on many of these occasions, Greeks or Romans at certain periods of their national history; and even thus limited, there are few assertions which will hold good of 'the ancients' generally. For the most part, perhaps, the looseness of the expression is corrected and limited by the subject or the context; but it is also true, that real misapprehension has arisen from the practice of throwing together and confounding the most dissimilar things by the help of this comprehensive term.

This is not the place to enter on the consideration of ancient and modern history, but there is an evil in some measure connected with the use of these terms, which it may be worth while to notice. It is to be feared that the common division of the subject of history into two parts, ancient, and modern, too often conveys the notion of an actual separation which does not exist. The young student pictures to himself a great gulf between them. When busy with the ancient part of the subject, he imagines himself to be conversing with beings of a different nature from himself. He believes the narrative, but is affected by it much as he would be by a work of fiction. When he has crossed the gulf, and passed from the obscure regions of ancient history into the stronger realities of modern times, he converses freely with beings of the same flesh and blood with himself. It is not requisite to enumerate all the bad effects which must arise from this impression. It is evil enough that the student must necessarily overlook the important fact, that the subjects of what are called ancient and modern history are so far one and indivisible, that a liberal and comprehensive view of the ancient part is necessary for the profitable study of the modern.

ANCILLA or ANCILLA'RIA, are the names given by Lamarck to a genus of spiral, univalve, marine shells, allied to the olives. Like them they are covered with a hard shining coat, destitute of any periostraca, and are immured in the large foot of the animal, so that the middle of the back of the shell can be alone discovered. They chiefly differ from the *olives* in the suture of the whorl, being callous and not furnished with a groove, formed by a thread-like filament placed at the end of the mantle, which is wanting in this genus: they are also furnished with a small ovate operculum. The species are numerous, and are chiefly confined to tropical climates: some have a small tooth, like the unicorn shell (*Monoceros*), placed at the end of a groove crossing the front of the shell. The best known species is the *ivory shell*, which with a few others differ from the rest of the genus in having the front of its axis deeply pierced.

ANCILLON (CHARLES), the son of David Ancillon, was born at Metz, on the 28th of July, 1659. After having studied at Marburg, Geneva, and Paris, he was admitted to the bar in Paris, and then commenced the practice of his profession in his native place. He was obliged, however, along with his father, to leave Metz on the revocation of the Edict of Nantes. When the elder Ancillon some time after settled in Berlin, Charles followed him thither, and the elector of Brandenburg appointed him judge and director of the French inhabitants of that city. He was afterwards promoted to the offices of inspector of the tribunals of justice for the refugees in Prussia, superintendant of the French school, and royal historiographer; and was also employed by the elector on a diplomatic mission to the Swiss Cantons. He died at Berlin on the 5th of July, 1715. Ancillon, who was one of the most learned lawyers of his time, is the author of various works, both upon subjects connected with his profession and others, the principal of which are enumerated in the *Biographie Universelle*, our authority for the above facts. The production for which he is now chiefly remembered is his *Traité des Eunuques*, 12mo., 1707, which is said to contain a great deal of curious learning.

ANCILLON (DAVID), a very learned French Protestant clergyman, the father of the subject of the preceding article. He was born on the 17th of March, 1617, at Metz, where his father was an eminent lawyer. Having attended for some years the Jesuits' College there, he went to Geneva, in 1633, to complete his studies in philosophy and theology; and in 1641, was licensed to preach by the synod of Charenton, and appointed minister at Meaux, the most important of the stations under their jurisdiction then vacant. Here he remained till 1653, having in the mean time married a lady of large fortune. The match is stated to have been arranged by his congregation, with the view of retaining him among them. In 1653, however, he accepted a call to his native town of Metz; and here he continued to officiate with great reputation till the revocation of the Edict of Nantes, in 1685, when he retired to Francfort. He was soon after chosen minister of the French church at Hanau; but this post, after a short time, he voluntarily resigned, having been induced, it is said, to take this step by the annoyances which he suffered from his brother clergymen, who were jealous of his superior eloquence and reputation. At first he went back to Francfort; but soon proceeded to Berlin, where he was received with great favour by the elector of Brandenburg. Here he continued to reside till his death, on the 3d of September, 1692. He is the author of several works, principally in defence of the reformed faith, the titles of which may be seen in the authorities referred to below. Perhaps, however, the most favourable impression of his varied learning is to be obtained from the work, entitled *Mélange Critique de Littérature Recueilli des Conversations de feu M. Ancillon*, published at Basle, in 1698, in two volumes, 12mo., by his son Charles. It is a collection of the colloquial remarks of M. Ancillon, and has been often classed with the *Scaligerana* and other publications with similar titles, although the editor in his preface gives his reasons for not designating it *Ancilloniana*. An extensive and valuable library which this learned clergyman had collected by a large expenditure during forty years, he was obliged to leave behind him when he fled from Metz on the revocation of the Edict of Nantes; and the books and manuscripts were all pillaged and dispersed. A life of Ancillon was published at Basle, in 1698, by his son Charles, in a duodecimo of 300 pages, (often to be found forming the third volume of the *Mèlange Critique*,) with the title of *Discours sur la Vie de feu M. Ancillon et ses Dernieres Heures*; and he is also the subject of an article of considerable length in the second and subsequent editions of Bayle. The above particulars have been chiefly taken from the latter source. (See also the *Biograph. Universelle.*)

ANCLIFFE, or ANCLIFF, a hamlet near the town of Wigan in Lancashire, where was formerly a singular well, called by the inhabitants the 'burning-well.' The true cause of the phenomenon appears to have been the escape of carburetted hydrogen gas from the earth at the bottom of the well, which, passing rapidly through the water, gave it the appearance of boiling, and took fire if a lighted candle was applied to the surface. Leigh (*Nat. Hist. of Lancashire*, &c., Oxford, 1700) thus describes it:—'It is about two miles from Wigan, in a village called Ancliff, in the ground of William Mollineux, Esq. of that place. The well is at the bottom of a tree, the water cold, and without any smell; when any person comes to see it, a man clears the well from all its water: that done, you will immediately hear a hissing noise in a corner of it, and by holding a lighted candle near to it, the sulphureous *halitus* (vapour) immediately takes fire, and afterwards spreads itself upon what water has issued in, and it is only then indeed it ought to be called the burning-well. It is observable, though this sulphureous *halitus* continually mixes with water, yet the water continues cold, nor will it tinge silver.' An account of it by Thomas Shirley, Esq., in the *Philosophical Trans.* No. xxvi. p. 482, corroborates the above statement in its main points. 'When the water was cleared away, the cone of the flame ascended a foot and a half from the surface of the earth: the basis of it was of the compass of a man's hat about the brim. I then caused a bucket full of water to be poured on the fire,' adds Mr. Shirley, 'by which it was presently quenched. I did not perceive the flame to be discoloured like that of sulphureous bodies, nor to have any manifest smell with it. The fumes when they broke out of the earth and pressed against my hand were not, to my best remembrance, at all hot.' The well, or its peculiar property, is now lost. *Beaut. of Eng. and Wales.*

ANCO'NA, a seaport town in the Papal states, on the coast of the Adriatic sea, 43° 38' N. lat. 13° 35' E. long. Ancona is the capital of a delegation or province, governed by a delegate who is a prelate of the Roman church. The court of appeal for the whole of the marches and of the duchy of Urbino sits at Ancona. This town is the most commercial place in the Papal states; it carries on a considerable trade by sea, and is a free port. Its harbour, which is good, is protected by two moles, the antient one raised by Trajan, and the new one with the light-house constructed by Pope Clement XII., after the designs of the architect Vanvitelli, who also began the handsome lazzaretto for the quarantine of vessels coming from infected countries, which was completed by Pius VI. On the antient mole stands a fine triumphal arch dedicated to Trajan, his wife, and his sister; the order is Corinthian, and the material Parian marble, which still retains its whiteness. It is entire, though long since stripped of the metal ornaments, statues, and busts with which it was once decorated. The arch has only one gateway, and is ornamented with four columns on each front.

The town of Ancona is built on the declivity of a hill which forms a semicircular promontory. The streets are narrow and gloomy, except one fine street, which Pius VI. opened, leading to the mole. The citadel, built on a hill, commands the town and harbour, but is itself commanded by the neighbouring heights. The cathedral is a very old structure, built outside the town, on the site of the former temple of Venus, and near the point of the cape, from which there is a fine view of the coast of Romagna and of the Adriatic sea. The other remarkable buildings are the town-hall, the merchants'-hall, the arsenal, and the churches of the Dominicans and the Augustins.

Ancona is said by Strabo (p. 241, Casaub.) and Pliny to have been built by some Syracusans who fled from the tyranny of Dionysius. Juvenal calls it a Doric colony; it is probably older than the date assigned to it by Strabo. The name of *Ancon* (ἀγκὼν) means an elbow, such being the shape of the neck of land on which it is built. The Romans made it one of their principal naval stations on the Adriatic. In the middle ages, it governed itself as a republic under the protection of the popes, until 1532, when Clement VII., partly by artifice and partly by force, made himself absolute master of the town. The French occupied it in 1797, and it was afterwards retaken by the Austrians in 1799, after a long siege. A French expedition by sea took possession of the citadel again in 1832.

The situation of Ancona is pleasant and healthy, the country around is very fertile, and the women are reckoned among the handsomest in Italy. The population, according to the latest accounts, is about 30,000, of whom 5000 are Jews. Ancona exports wax, silk, wool, and corn. It is the best, indeed the only good harbour on the Italian coast of the Adriatic between Venice and Manfredonia, and is the common point of departure for the Ionian islands and Greece. Packets are established between Ancona and Corfu.

ANCRE, (MARE'CHAL and MARQUIS D'). To this high military rank and title was raised a poor and obscure Florentine gentleman of the name of Concini dei Concini, son of a notary. He came to Paris in the suite of Maria de' Medici, whom Henri IV. of France espoused after he had repudiated Marguerite de Valois. Concini soon after his arrival married Eleonora Galigai, one of the queen's women of the chamber. Both were ambitious, persevering, and endowed with those abilities which, at that time, ensured success at court. On Maria de' Medici becoming regent after the assassination of Henri IV., the elevation of Concini was extremely rapid. He was first made equerry to the queen, then master of the horse, and soon after his purchasing the marquisate of Ancre (under which name he is known in history) he was made first gentleman of the king's chamber. The dignity of Maréchal of France was also conferred on him by the Queen Regent. Such sudden elevations, and rapid accumulation of immense wealth, not only gave rise to suspicions very unfavourable to his character, but excited the jealousy of the court. His insolence to the young king and his overbearing manner to the nobles were the cause of that hatred which brought him to a dreadful end. For some time attempts were made, but in vain, to hurl the Italian adventurer from his envied elevation; the princes themselves joined against him without success. However, a young man of the name of Laynes, (known afterwards as Duc de Laynes,) who was in great favour with the young king, persuaded him to deliver the queen-mother from the power of her favourite, and urged his insolent bearing to the nobility, and his pernicious influence, with so much success, that at last Louis XIII. ordered the Maréchal to be arrested, and even to be put to death if he resisted. Vitry, a captain of the king's guard, was entrusted with this commission, which he executed to its fullest extent. Ancre was shot dead as he was entering the palace of the Louvre. On hearing the shot, the king looked out at the window, and expressed his satisfaction, which he testified by raising Vitry to the rank of Maréchal of France. The body of the murdered man was first secretly buried at St. Germain l'Auxerrois, but was soon after torn from the tomb by the infuriated mob, who dragged it through the streets on hurdles and then threw it into the highway. Concini's son, sixteen years of age, was obliged to fly to Florence, after having been exposed to all sorts of insults, and deprived of his father's titles and riches. Eleonora soon shared the misfortunes of her husband. She was accused and convicted of sorcery, judaism, and corruption; and was executed at the Place de Grève, on the 8th of July, 1617. During her trial, and at the moment of her execution, she displayed the greatest firmness of mind, saying, the only sorcery she had used towards the queen 'was the power of a strong mind over a weak one.' It is said she was the first instrument of the fortune of Richelieu.

ANCUS MARCIUS, the fourth king of antient Rome, belongs to a period when it is difficult to separate history from fable. The reigns of the kings of Rome seem to mark the chief stages of progress in the political constitutions of the state, rather than the succession of individual monarchs. The names of Romulus, Numa, and Tullus Hostilius are respectively connected with the origin of the three patrician tribes, the Ramnes, the Tities, and the Luceres, and with their settlement upon the several hills called the Palatine, the Quirinal, and the Cælian. Thus, under the three first kings, the patrician part of the Roman constitution had received its full development. To Ancus Martius, tradition assigned the honour of laying the first foundation of the *plebes*, or commonalty, that important element in the state, to which Rome, under the commonwealth, owed nearly all her greatness. His predecessor, attentive solely to war, had neglected the religious institutions established by Numa, and for his impiety had been destroyed by a thunderbolt with all his family. Ancus Marcius, whose mother, according to the tradition, was the daughter of Numa, restored the neglected rites, and endeavoured in all respects to imitate the pacific policy of his grandfather. But the neighbouring states, mistaking his love of peace for timidity or sloth, provoked him to hostilities by repeated aggressions on the Roman territory. In the successive wars with the Latins, the Veientines, and other states, which ensued, he was invariably successful. From the Latins he took the towns Politorium, Tellenæ, Ficana, Medullia, and transferred their inhabitants to his capital, giving them as a place of abode, not indeed any ground within the walls, but a part of the Aventine and the valley near the temple of Venus Murtia which separated that hill from the Palatine. Ancus was thus the founder of the *plebes*, and his assignment of part of the public domain to that body procured him in after times from one party the title of the 'Good Ancus,' (Ennius in Festus, v. *Sos*, quoted too by Lucretius, iii. 1038); others condemned his unworthy love of popularity (Virg. *Æn.* vi. 816). The Latin towns just mentioned are supposed to have been situated between Rome and the coast; and indeed the conquests of the king extended to the mouth of the Tiber, where he established a colony under the name of *Ostia*, thus securing to Rome the navigation of the river. In his war against Veii he was equally successful; and to protect his people on that side he fortified the *Janiculum*, and connected it with the city by means of the Sacred Bridge called the *Pons Sublicius*, in the construction of which no brass or iron was used. This bridge, repaired from time to time under the direction of the college of priests called *Pontifices*, (bridge-makers,) who religiously adhered to the principle of excluding all metal, lasted until the year 23 B.C., when it was carried away by an extraordinary inundation of the Tiber, and its place supplied the following year by a stone bridge erected by the censor Æmilius Lepidus. A still more durable monument connected with the name of Ancus is the prison formed out of a quarry in that side of the Capitoline hill which overlooks the Forum. It would be idle to copy from Dionysius the detailed account of the transactions which are said to have filled the reign of twenty three or twenty-four years assigned by the chronologists to this monarch. It has been already stated that Ancus Marcius was said to be the grandson of Numa. In this tradition Niebuhr sees a trace of the regulation by which the kings of Rome were chosen alternately from the two leading tribes. The plebeian family of the Marcii vainly endeavoured to refer their origin to this king. (Livy i. 32-35, Dionysius iii. 36-45, with Niebuhr's *Roman History*, translated by Hare and Thirlwall, vol. i. p. 346-350.)

A′NCYLUS is the name of the shell which is usually called the fresh-water limpet. They are small, pellucid, conical shells, with slightly recurved tips. The cavity is simple, and marked with a horse-shoe-shaped muscular scar near the margin, which is interrupted on the middle of the left side over the respiratory holes, as in the genus *Syphonaria*. This animal, like the pond-snail (*Limnea*), has two compressed triangular tentacles, with the eyes sessile on the outer base; and a respiratory cavity placed on the middle of the back, with an aperture closed by a valve opening in the middle of the left side.

This genus is very nearly allied to the pond-snail, *Limnea*, from which it chiefly differs in the simple conical form of its body and shell, and some species, as *Ancylus*, are allied to it by having the apex bent on one side, as if making an approach to the spiral form. It has been placed in several orders, but there is little doubt that its true situation is with the lung-breathing mollusca. Treverianus has mistaken the lid of the respiratory opening for a gill; and Rang places it with the *semiphillediens*. They are found in Europe, America, and the West Indies, attached to stones and plants, and they will live a considerable time out of the water. They are easily known from the *Syphonariæ*, which are the only shells they can be confounded with, by their being sinistral, very thin, and covered with a hairy periostraca.

ANCY′RA, now Angora, or Engour, was one of the most important cities of Asia Minor. Tradition ascribed its origin to Midas, and its inhabitants exhibited in a temple of Jupiter a sacred anchor, which was said to have been discovered at the time of its foundation. This was, probably, a Greek invention, to account for the name of the city, but be this as it may, an anchor appears on the coins struck in the reigns of Antoninus, Severus, and Caracalla. When the hordes of Galli or Galatæ established themselves in the heart of Asia Minor, Ancyra became the capital of a tribe which had originally come from the neighbourhood of Toulouse, called Tectosages. In B.C. 189, the whole of Galatia was subdued by the arms of Manlius, and from this time it was for the most part virtually dependent upon Rome. Towards the close of the Republic, Deiotarus, who, by right, was the Tetrarch of the Tectosages alone, had extended his authority over the other Galatian tribes, and even assumed the title of king: but under Augustus (B.C. 25) it was found convenient to reduce the whole country to the form of a province, of which Ancyra was still the capital. Though deprived of its nominal independence, the city flourished under the favour of Augustus, and the inhabitants in their gratitude appear to have offered religious honours to the monarch. The city was permitted to assume the name *Sebaste*, (the Greek term corresponding to the Latin *Augusta*,) and at the death of the emperor, when an inscription on brass was erected at Rome to commemorate his achievements, the citizens of Ancyra procured a copy and had it inscribed on marble in Greek and Latin, and placed in one of their public buildings, which was probably a temple dedicated to Augustus, under the character of Lunus. This inscription, called the *Monumentum Ancyranum*, was discovered in 1554, by Wrantz, bishop of Agria and ambassador from Ferdinand II., at the Ottoman Porte. A more correct copy was taken by Tournefort in 1701, and by him communicated to Chishull, who ably supplied many of the lost words by conjecture, and published it in his *Asiatic Antiquities*. It has been repeatedly printed since, particularly as an appendix to the writings of Tacitus. (See Oberlin's edition, tom. ii., p. 586.) The greater part of the Latin inscription was still standing in the building as it had been originally put up, but in many parts it had been mutilated in the attempts to remove the copper cramps with which the different pieces of marble had been connected together. Suetonius, in his *Life of Augustus*, c. 101, speaks of the original inscription at Rome, from which the Monumentum Ancyranum was copied. Augustus, says he, besides his will left four volumes, one of them containing a summary of all his achievements, which he wished to be cut in tables of brass and erected in front of his mausoleum. This inscription, by its historical importance, fully deserves the title of *the* monument of Ancyra, but there are many others which are worthy of mention, particularly that which Montfaucon has given in his *Palæographia*, p. 154, containing an enumeration of public festivals at the expense of certain individuals there named. Among these public benefactors, one cannot but remark Albiorix, the son of Ateporix, two names which bear a strong resemblance to those which occur in Cæsar's *History of his Gallic Wars*, as Dumnorix, &c. Other inscriptions may be seen in Tournefort's *Voyage du Levant*, tom. ii., but this traveller was compelled to leave many unnoticed. A skilful antiquary, he observes, would still find inscriptions enough to occupy a year in copying. The high importance of Ancyra under the empire is proved by the numerous coins it issued, and by the immense number of its public buildings, the scattered remains of which are seen in all quarters of the present city. Above all was it celebrated as one of the chief seats of religion, so that Libanius calls it the sacred city. Coins and inscriptions refer to the worship of Jupiter, Ceres, Bacchus, Pallas, Apollo, Cybele, Lunus, Salus, Æsculapius, Serapis, the Dioscuri. It was also the seat of one of the earliest Christian churches, founded, probably, by the apostle St. Paul: accordingly, in the years 314 and 358, Christian councils were held here. Pagan worship, however, had not yet ceased, and when Julian visited Ancyra in 362, he was received without the walls by religious processions from all the temples of the city. As the power of Rome declined, the frontiers were exposed to the ravages of various enemies. In 625, Ancyra was taken by a general of the Persian Chosroes. In the following century it twice fell into the power of the Arabs. In 1085, it was taken by the Turks, but in 1102 recovered for a time by the Franks. After being for a considerable period the capital of the Turkish empire, it again changed masters in consequence of the great battle between Tamerlane and Bajazet, which was fought in the adjoining plain, July 28, 1402. In 1415, it was recovered for the Turks by Mohammed I., and since that period has always belonged to the Ottoman empire. The population, according to the Abbé Belley, consisted of 40,000 Turks, 4000 or 5000 Armenians, having seven churches, and 600 Greeks, having two churches. The present population is not known, though it is considerable. Its chief commerce consists in articles manufactured from the bright, silk-like wool of the Angora goat. At the beginning of the last century, there were resident merchants there from England, France, and Holland. The town is situated near the sources of the most eastern tributary of the Sakaria, or Sangarius, and at a distance, according to our maps, of about twenty miles from the Halys, which, in that quarter, reaches its most western limit. In Leake's *Map*, twelve antient and modern roads are seen to meet in Angora, which is the best evidence of the importance of the city. It has been visited by Tournefort, Lucas, Pococke, Brown, Bruce, Kinneir. It lies in 32° 46′ E. long., 39° 52′ N. lat. (See Tournefort, *Voyage du Levant*, tom. ii., p. 244; *Mémoires de l'Academie des Inscriptions*, tom. xxxix., p. 391; Rasche, *Lexicon Rei Nummariæ*, article 'Ancyra.') There was another Ancyra in Phrygia Epictetus, the precise position of which is unknown. The coins of both towns have the name in the form ΑΝΚΥΡΑ, not ΑΓΚΥΡΑ.

ANDALUCI'A or **ANDALUSI'A**, the most southern of the provinces of Spain, comprises the four Moorish kingdoms of Seville, Cordoba, Jaen, and Granada. It is situated between 36° 4′ and 38° 25′ N. lat., and 2° and 7° 20′ W. long.; is bounded on the north by La Mancha and Estremadura, on the east by Murcia, on the south-east by the Mediterranean, and by Portugal on the west; it extends, in its greatest length, 320 miles from east to west, and 144 from north to south. It was included in the Roman province of Bætica, so called from the river Bætis, now Guadalquivir. The present name, according to the most general opinion, it received from the Vandals, who established themselves in it about the beginning of the fifth century of our æra.

Two chains of mountains traverse this province; the most southern, and that which also has the highest summits, is called the Pœno-Bætic range by some geographers. It extends from Tarifa to Cape Gata, a distance of about 240 miles in length, without reckoning its sinuosities or windings; its breadth, from the Sierra de Bedmar to Cape Sacratif, is from 75 to 80 miles. The direction of this chain is first from south to north, and then from east to west: in its course it takes different names. The Sierra de Gazales, which is the most southern branch of the mountains of Europe, extends from 36° 4′ to 36° 30 N. lat. The Sierras of Ronda, Abdalazis, and Prieta then follow in a direction from south-west to north-east from 5° 12′ to 3° 57′ west long.; then follow the Sierras of Loja, Alhama, Tajada, and Lujar, and approach the shore of the Mediterranean in a direction from north-west to south-east, from 3° 57′ to 2° 57′. From the Picacho de Veleta it takes the name of Sierra Nevada, and then runs from west to east as far as 2° 27′, after which, taking a direction south-east and afterwards south, it becomes the Sierra de Filabres. This Sierra joins the Sierra de Aljamilla, and divides itself into two branches, one of which abuts on the sea at Cape Gata; the other branch proceeds eastwards to the Torre de Roldan. The inferior range of mountains parallel to the Sierra Nevada, for the distance of about 45 miles from Motril to Almeria, is called Alpujarras, an Arabic name, meaning grass and pasture mountains. This chain includes the Sierra de Gador and Contraviesa, and its western extremity joins the heights of Lujar and Jolucar. The strata or rocks which form the Sierra Nevada are inclined in a direction almost parallel to that of the central chain. The slope of the Alpujarras is abrupt on the north, but on the south it extends itself gradually, so that the hills slope down to the sea-shore.

The Sierra Nevada is mainly composed of mica-slate which passes into gneiss and clay-slate: on the south slope the clay-slate rests on the mica-slate, and is covered by a black transition limestone rock, rich in sulphuret of lead. Near Granada there is a quarry of serpentine on the banks of the Genil: it is green, mixed with a great quantity of blue, and susceptible of a good polish. Fine marbles, also, and alabasters of a brilliant white colour, but of a very soft quality, are found near Granada. This chain has several points covered with perpetual snow; the highest of which Mulhacen, is 11,660 feet above the sea. The next in height is the Picacho de Veleta, 11,385 feet. This point offers one of the most imposing views in Europe. In the centre of a magnificent panorama, the observer beholds himself surrounded by snow and tremendous precipices; farther on to the north he perceives the inferior summits of the chain, terminating in verdant plains bounded by the summits of the Sierra Morena, a distance of about eighty miles, and on the south he beholds at his feet the waves of the Mediterranean beating against the rocks of the shores, and in a clear day he may perceive the coast of Africa, distant about 125 miles. The lake of Caldera, which is the source of the Guadalfeo, is on the Mulhacen and 10,112 feet above the sea. The Sierra de Gador is 6575 feet high, and covered with snow three parts of the year. The Cresta de Gallo, or Cock's Comb, in the Sierra de Ronda, to the S.E. of the town of that name, is the first point discovered by ships approaching Cadiz. The hermitage of Nuestra Señora de las Nieves, (our Lady of the Snow,) on the same mountain, is elevated 6011 feet (See *Orographie de l'Europe.*)

This range being so contiguous to the sea, the rivers on the south side may more properly be called torrents than rivers: the principal of these, the Guadiaro, the Guadaljorce, the Adra, the Almeria, and the Guadalfeo, fall into the Mediterranean. The Genil, the Darro, celebrated for the particles of gold found in the sand which it carries, the Guadiana Menor, and a few others of less note, swell with their waters the current of the Guadalquivir.

A branch of the Pœno-Bætic chain which serves as a boundary to the plains of Granada on the north, connects it with the Marianic range by its junction with the Sierra de Cazorla. The length of this chain from Cape St. Vincent to the Sierra Segura, in Murcia, including the mountains of the Algarves, is about 360 miles, and its greatest breadth between Cordoba and the river Guadalmez nearly sixty. From its eastern extremity to the source of the river Tinto, near the boundary of Spain and Portugal, between 2° 32′, and 6° 12′ W. long., it runs from E.N.E. to W.S.W., that is, almost parallel to the Pœno-Bætic, and takes the names of Sierra de los Pedroches, Cordoba, Constantina, Guadalcanal, and Monasterio. At the last point it is divided into two branches, one of which takes the name of Sierra Albaleira, and runs in a western direction to the banks of the Guadiana; the second proceeds south-westwards under the name of Sierra de Aroche, and is separated by the Guadiana from the Sierras of Caldeiraõ and Monchique in Portugal: the Caldeiraõ runs W.N.W., and the latter S.W., and partly form the southern limits of the province of Alemtejo in Portugal. This range does not contain any remarkable summits, nor any of sufficient elevation to retain the snow for nine months in the year. The heath, kermes-oak, and other plants of shining and dark green leaves, with which it is covered, give it a dark appearance, from which the name of Sierra Morena, or Dark Mountain, is given to part of the range. Its formation is principally schistose; the Sierra de Caldeiraõ presents volcanic remains, and basalt is found near Almagro on the high road from Madrid to Cadiz. Though the Marianic range is the great boundary between the waters of the Guadiana and Guadalquivir, yet many rivers which have their sources on the north side of the chain intersect it, and fall into the Guadalquivir on its right bank; except the Tinto and a few more, which empty themselves into the ocean between Moguer and Huelva. The Sierra Morena contains the richest deposit of minerals in Spain: it produces mercury, lead, copper, silver, and gold: it is also exceedingly abundant in pasture, and well adapted to cultivation. The high road from Madrid to Andalusia cuts this chain in its narrowest and most elevated part, called Despeña Perros, or the Precipice of the Dogs. Another communication is open in this chain, which connects Andalusia with Estremadura by the Puerto of Monasterio. These are the only roads in the Sierra Morena: there are other communications through it, which, if not impracticable, are at least very insecure.

The Guadalquivir is the largest river in Andalusia. Bory de St. Vincent says that its real source is the Guadarmena, a river which, springing in the north-eastern extremity of La Mancha, flows in a direction south-west, cutting as it were the Sierra de Alcaraz, and with an inclination to the south, after having received the waters of the Guadalimar, falls into the Guadalquivir in the plains of Ubeda. The Spanish geographers place the sources of this river in two fountains, distant about seventeen miles from each other, on the Sierra de Cazorla 38° N. lat., and 3° W. long. The windings of this mountain force it at first to follow an irregular course. After having received the Guadiana-Menor, near Jodar, it flows towards the west as far as Montoro, and then to S.W., gathering all the torrents which descend from the Sierra Morena on the northern bank, and on the southern, the streams that flow from the Sierra de Bedmar, Jaen, and Cabra. The Guadajoz, which crosses the high road from Madrid to Cadiz not far from Cordoba, is one of its greatest affluents on the southern bank. At Palma del Rio it receives the Genil, and continues a W.S.W. and S.S.W. course nearly to Seville. Beyond that city it flows almost due south without any obstacle, through a level country with a winding course, and dividing itself into several branches, forms two islands, called *Isla Mayor* and *Isla Menor*, or *Great* and *Small Island*. At the southern extremity of the Isla Mayor these different branches rejoin, and the river enters the sea near San Lucar de Barrameda.

The extent of country which this river traverses from the Sierra de Cazorla, lat. 38°, to the Punta de Chipiona, situated, according to the Derrotero de Tofiño, in 36° 44′ 18″, is about 276 miles; but the course of the river, following all its windings, is at least 350 miles. The Guadalquivir is navigable as far as Seville; and a company has undertaken to remove the obstacles which impede the navigation to Cordoba. The affluents of the Guadalquivir, besides those mentioned, are the Guadiel, the Escobar, the Jandula, the Yeguas, Arenales, Guadalmellato, Guadabarbo, Bembezar, Guadalbacar, Galapagar, and Viar, which flow into it on the northern bank; and on the southern Jandulilla, Ninchez, Torres, Guadalbullon, Salados de Arjona, or salt streams of Arjona, Corbones, Guadaira, and Tagerete.

The plains of Andalusia, notwithstanding their being situated in one of the warmest climates of Europe, are still generally speaking of a moderate temperature. It never freezes in them, and the snow never remains long upon the ground. The unhealthy and scorching winds, which come from Africa, are cooled and purified by the snowy summits of the Sierra Nevada, and rarely produce those pernicious effects observable in the country from which they blow.

On arriving at Despeña Perros, on the route from Castile to Andalusia, the most inattentive observer will immediately perceive that the productions of nature are changed. On the northern side, the Marianic range presents nothing but rosemary, cistus, and other plants indicating a parallel of latitude equal to the south of France; the southern side presents itself at once covered with mastic-trees, kermes-oak, bean-trefoil, myrtles, and other plants of warmer climates; as he descends, the lower parts are covered with the species of umbelliferous, papilionaceous, and other plants properly belonging to the Flora of Africa. From Carolina, the first of the colonies of the Sierra Morena, long and strong hedges of the American aloe form the common enclosures of the grounds. At a distance the stately palm-tree rears its lofty head above the olive, pointing out the house of the farmer or the garden of some convent. The mesembryanthemum, or fig-marigold, ornaments the dwelling of the humble inhabitant of the village, with its brilliant scarlet flower. At Seville the banana plant is found in many gardens; and exotics, which even at Montpelier require to be kept in a green-house, are here common in the open air. As we approach the sea-shore the European vegetation almost disappears, and is replaced by plants properly belonging to the Flora of Arabia, Egypt, and Barbary: the chamærops or dwarf-palm, which never rises to the elevation of a tree, occupies all the space that the husbandman has left uncultivated: the caper plant occupies all the wild and gravelly spots. The *acebuche* or wild olive-tree, and the woody astragalus, take possession of all the space abandoned by man. The sage, the gum cistus, various species of thymes, the rosemary, the myrtle, and other aromatic plants, cover the uncultivated heights. The orange and lemon trees, particularly around convents and monasteries, form groves of considerable extent, which in the time of blossoming fill the air with a delicious perfume. At that season the inhaling of so many odours, in which the balsamic perfume of the cistus is distinctly perceived, especially before and after sunset, gives a delightful sensation of the salubrity of the air. Within fifteen or twenty miles from the coast, the plants of America are so adapted to the soil as to have become almost naturalized the nopal, on which the cochineal insect is fed, is very successfully cultivated near Cadiz; and the same plant forms the hedges of the vineyards of the Hoya de Malaga. The sugar-cane and the cotton-tree occupy the plains of Velez-Malaga, Torroj, and Motril: the pomegranate is a very common tree in all that part. With so great a variety of productions, the season of blossoming must necessarily be very long; it begins about the end of January, with the almond-tree, and ends in June with the olive. The harvests also of fruit and grain succeed one another throughout the whole circle of the year, beginning in February or March with the sugar-cane, and ending in March or April with the orange, on which tree it is not an unfrequent occurrence to find the fruit and blossom together. Even when the heat of the sun has dried up the smaller rivers, their banks are covered with the rosy flower of the adelfa, or rose-bay tree. The soil is so productive, particularly in the plains, that the husbandman with very little trouble may obtain an abundant harvest. Besides all the species of corn and fruit, wine and oil make the bulk of the productions of the soil. Among the wines, the Jerez or sherry, the Pajarete, Malaga, Montilla, Espera, Bornos, and Tintilla, are the most celebrated. The rich pastures of the mountains and valleys feed innumerable herds of cattle, among which the bulls have been renowned from the fabulous times of King Geryon. The woods of oak of the Serrania de Ronda, of Cordoba, and Granada, afford nourishment to a multitude of hogs; and the Loma de Ubeda, the Dehesa of Cordoba, and the Cartuja of Jerez, produce the finest breed of horses in the Peninsula. The seas and rivers abound in fish, and the mountains in every species of game. The wolf and the boar are the only ferocious animals; among the reptiles and insects, the scorpion, the tarantula spider, the chameleon, and some snakes, though none of the worst kind, are found. The riches of the mineral kingdom are no less abundant. Sixty-six mines are known, which produce gold, silver, copper, iron, lead, loadstone, coals, vitriol, and sulphur.

Andalusia, under the Mohammedans, included four kingdoms, viz., Seville, Cordoba, Granada, and Jaen, but at present it is divided into six provinces; Seville, Cadiz, Cordoba, Jaen, Granada, and Malaga, containing a population of 1,904,276 inhabitants; two archbishoprics, six bishoprics, fourteen collegiate churches, the same number of military commandaries, 980 parishes, 760 convents of both sexes, with 18,063 monks, and 5,624 nuns, the whole comprised in 41 cities, 458 towns, 314 villages and boroughs. Andalusia is divided into two military departments, having each a captain-general, and a *Chancilleria*, or high civil and criminal court, one at Seville, and another at Granada.

The people of Andalusia appear to be a mixture of five different nations, which successively have had the dominion of that region,—the Carthaginians, the Romans, the Vandals, and the Goths, mixed with the original race, very probably of African origin. The Moors invaded it in 711, and it was not until 1491 that they were expelled from Granada, their last hold. Notwithstanding their expulsion, many traces of their character are still discernible. The complexion and features of the inhabitants, their dances, music, and musical instruments, many names of persons and places, the most trivial phrases, their prejudices, their system of agriculture, their hospitality, and part of the dress, especially among the women of some villages, and even their harsh mode of aspirating the Castilian language,—everything reminds the attentive observer of their Arabian ancestors. The Andalusian, inhabiting one of the finest climates in the world, where nature so liberally yields its riches, lives contented with what he possesses, is never anxious about the future, and is a stranger to sorrow. This sort of indifference and improvident disposition has caused him to be accused of indolence. The inhabitants of the plains of Seville may perhaps deserve that character; but the labourer of the Serrania de Ronda, of the Hoya de Malaga, of the Alpujarras, and in general all the people inhabiting the highlands, whom the sun when it rises always finds busied in their occupations, which they never quit until after its setting, cannot justly be taxed with indolence. In those districts the women are seen working in the fields, while the men are employed in reaping the harvest in the plains of Seville; and, when men and women work together, the former are observed to stop in their work now and then to smoke their paper cigars, while the latter, who do not enjoy that luxury, proceed in their task; which circumstance may probably have led inattentive travellers to make erroneous statements about the supposed idleness of the Andalusian people, and the miserable condition to which the women are reduced in that province. The same amount of credit is due to all the accounts and wonderful tales about the jealousy of the Andalusian men, and of the confinement in which they keep their wives. Possessing a powerful and lively imagination, the Andalusian express the most simple ideas in a figurative and energetic language, which may perhaps entitle them to the epithet of the Gascons of Spain. The *Sal Andaluza*, or Andalusian wit, though not so pungent, is not less celebrated in Spain, than the Attic wit was in Greece. The Andalusian women are remarkable for the gracefulness of their forms, for their expressive, large, and black eyes, and for their small, delicate feet. It is not, however, a rare occurrence to find among them some with blue eyes, a fair complexion, and light, flaxen hair. Andalusia has at all times produced eminent men. The great Trajan, the two Senecas, the poet Silius Italicus, and the agriculturist Columella, did honour to the Andalusian name under the Romans. The list of the eminent Arabs, who were born and educated in that province, is still more numerous; and, in modern times, the Granadas, Leones, Morillos, Cespedes, Herreras, Riojas, and also the best lyric poets in the Peninsula, were Andalusians by birth. If ever a rational and enlightened system of government should secure the property and allow the free development of the intellectual faculties of this people,—if the fixed rule of the law should ever be substituted for the caprice of man,—Andalusia will become the finest province in Spain. At present, though there are universities at Seville, Granada, and Cordoba, besides several colleges at Cadiz and other principal towns, education is not in the most flourishing condition. The unequal division of the land,—the best and largest portion of which is in the hands of the grandees, who never visit their possessions, and of monks, who care little about improving them,—keeps agriculture in a very backward state; and an oppressive and injudicious fiscal system prevents the advancement of trade and industry. (See Miñano; *Recueil de Voyages de la Société de Géographie de Paris*, vol. iii., pp. 8, 9. Antillon; Malte Brun's *Geography*, viii., book 138. Bory de St. Vincent's *Résumé Géographique de la Péninsule Ibérique*, section i., chap. 3, section ii., p. 472—502.

For the subdivisions of Andalusia, and the chief towns, see the names mentioned in this article.

ANDAMAN ISLANDS, a group in the bay of Bengal, consisting of four islands with several islets, in 92° 30′ E. longitude, and occupying a space which extends from 10° 32′ to 13° 40′ N. latitude. Three of these islands are so contiguous, being only separated by very narrow straits, that they are usually considered as one island, under the name of the Great Andaman, and are generally so laid down in maps. Another of these islands, which is known as the Little Andaman, is the most southern of the group. Rutland Islet lies between the two Andamans, and Great Sentinel Islet is on the western side of Great Andaman, in 11° 45′ N. lat., and 92° 3′ E. long. The remaining islets are not known by any distinctive names. The most northern of the Nicobar islands is within 30 leagues of the south of Little Andaman.

Great Andaman is about 140 miles long and 20 miles broad. In the centre is a high mountain called the Saddle Peak, which is about 2400 feet above the level of the sea. The island does not contain any considerable river. It is tolerably clothed with trees, several of which afford timber of sufficient size for ship-building; among them are the poplar, ebony, a tree resembling satin-wood, red-wood, the cotton-tree, and almond-tree, besides bamboos, ground-rattans, and numerous shrubs.

Very few animals are found on the islands; the principal of them is a species of small hog, which is scarce; the inhabitants use it for food. Besides these hogs, the Andamaners eat rats, guanas, and snakes, but their principal food consists of fish, of which there are many varieties, and, during the north-east monsoon, they are very abundant. The shores abound in shell-fish, and oysters of good quality are found in some situations. The edible birds'-nests, so highly prized in China, are sometimes seen in these islands, and a variety of beautiful shells—gorgonias, madrepores, and couries—may be gathered on the shores.

The fruit of the mangrove is almost the only vegetable substance in the islands that is fit for food. Cocoa-nut trees,—which are so plentiful and so prolific, both on the continent and the neighbouring islands,—have never been planted in the Andaman islands.

The inhabitants are among the very lowest in the scale of civilization of any people with which we are acquainted; they show determined hostility to Europeans, and repugnance to come into communication with them. They are small of stature, seldom exceeding five feet in height, and ill-formed, with large heads and very slender limbs. In colour, hair, and features they resemble the race of African negroes. They are wholly unaccustomed to the use of clothing; their implements are but few in number, and of a very rude description. They have no vessel that can resist the action of fire, their only mode of cooking consists in throwing their food upon burning wood. Their principal weapons of offence are bows and arrows. The former are usually from four to five feet long, and for strings they use fibres drawn from the leaf of a tree, or slips of bamboo; their arrows are formed of reeds, with heads of wood hardened in the fire, or of fish-bones. They also carry spears of heavy wood, with sharpened points, and are provided with a shield made of bark. They use both their arrows and their spears for killing fish, and show considerable dexterity in this occupation; they likewise make use of a hand-net formed of bark.

It is worthy of remark, that every people with whom we have become acquainted, however small their acquaintance with other arts, are possessed of the art of making nets of one kind or other, and thus forming articles of some utility.

The dwellings of the natives are rude in the extreme they are formed by fixing four poles in the ground and binding their tops together, filling up the spaces between them with branches of trees, and leaving a vacancy on one side just large enough to allow of ingress and egress. In their disposition, they are described as cunning and treacherous; their disinclination to the intercourse of strangers amounts with them to a passion. They make no attempt to cultivate the soil, and are obliged to reside in the immediate neighbourhood of the sea, from which they derive the principal part of their food. The population of the Great Andaman, it is conjectured, does not exceed 2500 persons; they unite in small societies, and move about from one part of the coast to another in search of food. These people are superstitious, and are believed to worship the sun; but our imperfect acquaintance with their customs does not allow us to express any decided opinions on this subject. On awaking in the morning, their first care is to plaster their bodies with mud, which hardens in the sun, and serves as a protection against the attacks of insects which swarm in the air, and would otherwise be a constant torment to them. This plastering, and the custom of painting their woolly heads with red ochre, does not tend to improve their naturally hideous appearance.

The origin of this race of people,—so different in their appearance and state of civilization from any of the races on the continent, or the neighbouring islands,—is an object of some curiosity. The people to whom they bear the greatest resemblance in their persons and dispositions are the mop-headed Papuas of New Guinea; but how they should have found their way to so great a distance, in their frail canoes, it is difficult to imagine. The language used by the Andamaners, as far as there are means for judging, appears to be wholly dissimilar to any spoken in other parts of the east.

A settlement was attempted by the English in 1791, on the south part of the largest island, which settlement was, two years afterwards, removed to Port Cornwallis, near the northern end, in 13° 28′ N. lat., and 92° 54′ E. long. One object for making this establishment was the possession of a commodious harbour on the east side of the Bay of Bengal, which might be a place of shelter during the prevalence of the north-east monsoon. The place was abandoned in 1796, in consequence of its proving extremely prejudicial to the health of the settlers. It is probable that this disadvantage might have been remedied by clearing the adjacent district, which consists of lofty hills covered with trees and jungle.

In 1814, when Port Cornwallis was visited by an English ship, very few vestiges remained of the British settlement. Subsequently (in April, 1824) the British force under Sir Archibald Campbell, despatched against the Burmese, assembled in the harbour, where some of the ships remained about a month; but it was not found possible on that occasion to establish any intercourse with the natives, who omitted no opportunity of showing their hostile feelings by discharging their arrows at all the Europeans who came within their reach.

The Little Andaman was visited, in November, 1825, by the Earl Kellie transport, for the purpose of procuring water for the troops which she was conveying to Rangoon, when the inhabitants showed an equally fierce disposition, and endeavoured as much as possible to obstruct our people while filling their water-casks. This smaller island does not possess any harbour, but has tolerable anchorage near the shore. It is twenty-eight miles long with an average breadth of seventeen miles. (Symes's *Embassy to Ava*, and MS. documents at the India Board, as quoted in Hamilton's *East India Gazetteer.*)

ANDAN'TE, in music, (participle of the Italian verb, *andare*, to go, *going*,) is the third in order of the five classes into which musical movement is divided, (see ALLEGRO,) and the medium between the extremes of slow and quick.

The music of former days, of Corelli, Handel, &c., which we agree to call antient music, was generally much slower than that which prevails at present, and *andante* was then used to denote a moderate degree of quickness: now it indicates a steady, calm motion, rather inclining to slowness than the reverse. It also enjoins a more than ordinary attention to the measure, to the equality of time given to each bar. It must be added, however, that composers often differ from each other in the meaning they annex to this word, a want of agreement which can only be remedied by invariably marking the commencing time of all movements by the metronome, or some kind of pendulum.

This term is also used substantively: thus we say, *an andante of Haydn*, &c.

ANDANTI'NO, in music, the diminutive of *andante*, but whether less slow or less quick, is still a question at issue. Rousseau, Türk, Clementi, and many others, are on the slow side; Koch, Burney, and Lichtenthal, espouse the other.

When the word *andante* is used, as by the old masters, to denote a degree of quickness, its diminutive abates its motion: when employed to indicate a movement rather slow than quick, as in the present day, the diminutive increases its motion. For want of adverting to this fact, much misapprehension and some disputes have arisen. It, however, seems to be agreed, that *andantino* now shall signify a movement quicker than *andante*—that it shall be the medium between the latter and *allegretto*.

ANDELYS (LES), a town in France on the right bank of the Seine, in the department of Eure. It properly consists of two towns, Grand (great) Andely, and Petit (little) Andely; though they are usually considered as one. It is a busy place, and contains a population of 5000 (Balbi), who are engaged in the manufacture of ratteen, a coarse woollen stuff. Many apples are grown in the neighbourhood for cider. Nicholas Poussin was born in an adjoining hamlet, or in the town itself: at Little Andely there is a monument to his memory. A castle in the vicinity is said to have been built by Richard Cœur de Lion. It is now in ruins.

The arrondissement of which Les Andelys is the capital comprehends 147 communes, and contains above 63,000 inhabitants.

ANDERNACH, a small town in a pleasant country on the left bank of the Rhine, in the district of Coblenz and the province of the Lower Rhine, 50° 27′ N. lat., 7° 25′ E. long., and about ten miles W.N.W. from Coblenz. It has some trade, chiefly in millstones, which are cut in the neighbouring villages of Ober and Nieder-Mendig, in bricks, clay for tobacco-pipes, and in trass, which is sent to Holland. This trass (see next page) is an earth, which is pulverized and mixed with lime to make a mortar suitable for constructions under water. Trass is a corruption of the Dutch word *tiras*, which signifies cement.

In Andernach numerous pieces of columnar basalt are employed as posts at the corners of streets, &c. The door-posts and side-pieces of almost all the windows are made of the porous lava of which the famous millstones are formed. This material is also used for paving courts and kitchen floors, and has been employed in the construction of some of the oldest buildings in this town, as well as in Coblenz. There are several mineral sources near the town. The place has about 3000 inhabitants, and a gymnasium. The vine is cultivated in the neighbourhood.

Andernach was a Roman station under the name of Antunacum. It was also once an imperial town, till the year 1496, when the elector of Cologne reduced it to the rank of a municipal town.

Physical structure of the surrounding country.—Andernach lies on the border of the mountainous region called the Eifel, which stretches between the Ardennes and the Rhine, and has been the seat at one time of many active volcanoes; but all have been extinct since a period long antecedent to the historical æra. The fundamental rock of the country is grauwacke, which may be seen in many places around Andernach; the volcanic products lie upon that, all the secondary strata being wanting. Between five and six miles west of Andernach is the Laacher See, or Lake of Laach, a spot celebrated for the beauty of its scenery. It is of a circular form, and is surrounded with woods which rise from the water's edge to the summit of the high sloping banks; a man at an ordinary pace requires about two hours and a half to walk round it. The surface of the water is 670 feet above the Rhine at Andernach, and the depth is about 200 feet. It has been commonly considered as the crater of a volcano, and the circular form and igneous products scattered around lead one very naturally to view it as such; but great weight is due to the observations of the Baron Van der Wyck in his *Uebersicht der Rheinischen und Eifeler erlöschenen Vulkane*, who considers the lake to be a depression in the grauwacke, and that the igneous products were ejected from five volcanoes in the immediate neighbourhood. There is no stream of lava, nor any walls of solid lava immediately adjoining the lake; the volcanic products on its shores are scoriæ or cinders, pumice and ashes, with numberless volcanic balls or bombs in the ashes; but solid lavas, basalts, and tuffs, are met with in all the hills and valleys around. Immediately in the neighbourhood of Andernach, and between it and the town of Mayen, there are great tracts covered with pumice stone, gravel, and ashes, often to a considerable depth; these substances are in many places covered by a yellow marly sand, containing land shells, called *loess*, and in some situations this loess is covered again with pumice stone, gravel, and ashes. Not far from the Laacher Sea are the celebrated millstone quarries of Nieder Mendig, which have been worked, it is believed, for at least 2000 years, and from which millstones are sent to every part of Europe and to America. The rock is a very hard porous lava, which in all probability was a stream from one of the neighbouring volcanoes. It is covered with the pumice stone, gravel, and ashes, in many parts, but it is supposed to be not less than five miles in length, and nearly three miles in breadth. The quarries are all underground, and are well worth visiting from the great extent of the excavations, and the forms of the lava, which separates into gigantic columns from fifteen to forty feet in height. Five miles north of Andernach is the Brohl valley, celebrated not only for its beautiful scenery, but on account of its containing vast accumulations of an indurated volcanic mud, which by subsequent denudations has been broken into detached masses, presenting great vertical precipices and many varied picturesque forms, clothed with a luxuriant vegetation. The substance is called *trass*, and has been long extensively quarried, it is pounded and used in making mortar for buildings under water, like the volcanic substance called *puzzolana* in the neighbourhood of Naples, and the artificial imitation of it, Roman cement. Vast quantities of it are exported to Holland, where it is used in the construction of the dikes.

The volcanic district of the Lower Eifel, which is immediately adjoining to Andernach, is very accessible to those who visit the Rhine. It is extremely interesting, not only to the geologist, but to all who take pleasure in looking upon beautiful natural scenery. There is a short account of it in Dr. Daubeny's work on *Volcanoes*, and a much more detailed description in Dr. Hibbert's more recent publication on the *Basin of Neuwied;* a book, however, that will not be very intelligible either to the general reader or to any one who is not tolerably familiar with geology. The best works on the subject are in German, of which there are several. The work of Baron Von der Wyck, above quoted, is excellent, and Steininger's *Geschichte der Rheinischen Vulkane* is very full; but the best we have seen is a compilation from other writers, together with valuable additions from personal observation, by Messrs. Von Oeynhausen and Von Dechen, in the *Geographical Journal, Hertha*, for the year 1828.

ANDERSON (ADAM), was born in Scotland in 1692. Having come to London, he obtained the situation of clerk in the South Sea House, with which establishment he continued to be connected for forty years, having risen at last to be chief clerk of the Stock and New Annuities. In the charter, granted in 1732, for the establishment of the colony of Georgia in America, Mr. Anderson was appointed one of the trustees to carry that object into execution; and he also held a seat in the court of assistants of the Scotch Corporation in London. He died, at his house in Red Lion Street, Clerkenwell, on the 10th of January 1765. The chief occupation of many years of Mr. Anderson's life was the composition of his voluminous and well known work, the *Historical and Chronological Deduction of Trade and Commerce*, which was first published in 2 vols. folio, in 1762. A second edition of the same size appeared in 1764; and a third, in 4 vols. quarto, (the fourth volume being new and by a different compiler,) in 1782-9, after the death of the author. This work contains a large collection of facts; but from the author's imperfect scholarship, or his limited command of books, he has taken many of them at second-hand, from translations, or books of little authority; and in the earlier portion of his book, especially, he has nearly neglected all the best sources of information. This defect has been to a great extent remedied in what may be considered a fourth edition of Mr. Anderson's work, the *Annals of Commerce, Manufactures, Fisheries, and Navigation*, by Mr. David Macpherson, 4 vols. quarto, 1805. The last three volumes of this publication are nearly a reprint of Anderson's *Historical Deduction;* but the first, which comprehends the history of commerce down to the fifteenth century, is entirely re-written. Mr. Anderson's style, we may add, is very prolix, and singularly antiquated for the period in which he wrote; but in many of his opinions upon commercial subjects he was in advance of his age.—James Anderson, D.D., a brother of the subject of this notice, was the author of a work entitled *Royal Genealogies, or the Genealogical Tables of Emperors, Kings, and Princes, from Adam to these Times*, published in 1732; of a *Genealogical History of the House of Ivery*, in 2 vols. 8vo., Lond., 1742 (the last volume having been prepared for the press after his death, and a third being promised, which, we believe, has never appeared); of a volume entitled the *Constitutions of Free Masons;* and also, we believe, of several single sermons. He was minister of the Scottish church, Swallow Street, London; and used to be known among his acquaintances by the name of Bishop Anderson. (See Chalmers's *Biograph. Dict.*)

ANDERSON (ALEXANDER), a native of Aberdeen, in Scotland, who in the beginning of the seventeenth century, while yet a young man, appears to have settled as a private teacher of the mathematics in Paris. Neither the year of his birth, nor that of his death, is known. He is the author of the following works: *Supplementum Apollonii Redivivi*, quarto, Paris, 1612; *'Αἰτιολογία, pro Zetetico Apolloniani Problematis a se jampridem edito in Supplemento Apollonii Redivivi*, quarto, Paris, 1615; *Ad Angularium Sectionum Analyticen Theoremata* Καθολικώτερα, *a Francisco Vieta Fontenæensi primum excogitata, at absque ulla demonstratione ad nos transmissa, jam tandem demonstrationibus confirmata*, quarto, Paris, 1615; *Vindiciæ Archimedis*, quarto, Paris, 1616; *Exercitationum Mathematicarum Dicas Prima*, quarto, Paris, 1619. All these works are very scarce. Mr. Anderson also appears to have been selected by the executors of the eminent Vieta, who died in 1603, to superintend the publication of his unprinted manuscripts. Two treatises of Vieta, accordingly, entitled *De Æquationum Recognitione et Emendatione*, appeared at Paris, in quarto, 1615, with a dedication, preface, and appendix, by Anderson. Mr. David Anderson of Finshaugh, a brother (other authorities say, a cousin) of this Alexander Anderson, was the father of Mrs. Gregory, the wife of the Rev. John Gregory, minister of Drumoak, in Aberdeenshire, whose son was the celebrated James Gregory, the inventor of the reflecting telescope. James Gregory is said to have been initiated in mathematical science by his mother. Of the same family, probably, was an Alexander Anderson, a native of Aberdeen, who graduated Doctor of Medicine at Leyden, in 1717. His inaugural discourse, which is entitled *De Morbis Acutis Puerperarum*, is remarkably thick sown with scriptural and classical quotations. (See Chalmers's *Biog. Dict.*, and Brewster's *Edin. Encyclop.)* In the Supplement to the *Encyclopædia Britannica*, there is a notice of Alexander Anderson by the late Professor Leslie, in which warm praise is bestowed upon the ingenuity, cleverness, and classic elegance of his works.

ANDERSON (SIR EDMUND), an eminent lawyer of the sixteenth century, in the early part of which he was born at Broughton, or, as other authorities state, at Hixborough, in Lincolnshire. His father, Thomas Anderson, Esq., was a gentleman of good estate; and the family was of Scotch descent. Edmund, who was a younger son, was educated at Lincoln College, Oxford, after leaving which he entered of the Inner Temple, and, having in due course been called to the bar, passed through the usual promotions, until, in 1582, he was made chief justice of the Common Pleas. This high office he held till his death, on the 1st of August, 1605. Chief Justice Anderson was one of the ablest and most learned of Queen Elizabeth's judges; but he was also one of the most rigid of the high prerogative lawyers of that time. He particularly distinguished himself by the zeal which he showed in favour of the established church, and the unwise harshness with which he endeavoured to put down dissent. We should scarcely, indeed, be going too far in saying of him that he was accustomed to regard law more than reason, and the will of the sovereign more than either. He seems, by his severity, to have made himself unpopular and odious with all parties. His printed works are *Reports of Cases argued and adjudged in the time of Queen Elizabeth, in the Common Bench*, folio, Lon. 1644; and *Resolutions and Judgments on the Cases and Matters agitated in all the Courts of Westminster, in the latter end of the reign of Queen Elizabeth*, quarto, Lond. 1653. Both books are reckoned of great authority. Three families, descended from this chief justice, through two of his sons, received baronetcies in the reigns of Charles I. and II.; and by his four daughters, who lived to be married, he became the ancestor of the earls of Pontefract, the Sheffields, dukes of Buckinghamshire, the earls of Warrington, and the lords Monson. (*Biograph. Brit.*)

ANDERSON (GEORGE), was born at Tunstern, in the duchy of Sleswick, in Germany, about the beginning of the seventeenth century. He appears to have been in a great degree self-educated. In 1644 he left his native country to travel in the East, from which he returned in 1650, after having visited Arabia, Persia, India, China, Japan, Tartary, Mesopotamia, Syria, and Palestine. He was then taken into the service of the Duke of Holstein-Gottorp, who often pressed him, but without success, to publish an account of his travels. At last the stratagem was resorted to of placing Adam Olearius behind the tapestry of a room in the palace, while Anderson, who was very communicative in conversation, was led to relate his adventures to the duke; and in this way the whole story was from time to time got out of him and committed to writing. He was afterwards prevailed upon to revise the manuscript, after which it was published in folio, at Sleswick, in 1669, under the care of Olearius. Anderson's travels, we believe, have never been translated into English. (See *Biog. Univ.*)

ANDERSON (JAMES) was born at Edinburgh on the 5th of August, 1662; his father, the reverend Patrick Anderson, was one of the ministers of that city. Having been educated for the law, he was admitted a writer to the signet in 1690. In 1705 he made his first appearance as an author by the publication of *An Essay showing that the Crown of Scotland is Imperial and Independent*; being an answer to W. Atwood's tract, entitled the *Superiority and direct Dominion of the Imperial Crown and Kingdom of England over the Crown and Kingdom of Scotland*, which had appeared the preceding year. As the subject discussed was one in which the people of Scotland at that moment took a very warm interest, the parliament, besides bestowing upon Anderson a pecuniary reward for his performance, ordered its thanks to be publicly returned to him by the lord chancellor, in the presence of her majesty's high commissioner and the estates; Atwood's book being at the same time ordered to be burnt by the common hangman. Anderson was further honoured by the commands of the parliament to collect and publish such antient documents as he might deem to be illustrative of the national independence; and an assurance was given that the cost of the undertaking would be defrayed from the public treasury. He therefore relinquished his profession, and in 1707 came to London to superintend the engraving of the plates for his intended work. Before it issued from the press, however, he was carried off by a stroke of apoplexy, on the 3d of April, 1728. The editing of the work was then entrusted to Thomas Ruddiman, the learned grammarian; and it at length appeared at Edinburgh in 1739, in the form of a magnificent folio, with the title of *Selectus Diplomatum et Numismatum Scotiæ Thesaurus*. An elaborate preface was prefixed by Ruddiman. Anderson held the situation of postmaster-general for Scotland from 1715 to 1717. He also published at Edinburgh, in 1727, *Collections relating to the History of Mary Queen of Scotland*, in 4 volumes, quarto. Although Anderson's name is prefixed to the *Diplomata* as the author of the publication, the credit to which he is entitled is very inconsiderable. The plates, which are well executed, are of course the work of the engraver, with the exception of those which contain explanations of the abbreviated characters; and all the rest of the book, comprising the valuable preface of 85 pages, the chronology of Scottish history, the explanations of the plates, the tables of geographical, and other proper names, is by Ruddiman. (See Chalmers's *Biograph. Dict.*, and Geo. Chalmers's *Life of Ruddiman*, p. 151, &c.)

ANDERSON (JAMES, LL.D.) was born, in 1739, at the village of Hermiston, near Edinburgh, where his forefathers had been farmers for several generations. He very early showed a great love of reading, and having, in consequence of the loss of both his parents, taken the management of the family farm into his own hands at the age of fifteen, he soon after began to apply himself to the study of chemistry, with the view of availing himself of that science in his agricultural pursuits. His adoption of various improvements in husbandry, which had never before been introduced into the district where he lived, afforded other evidences of his superior intelligence. In 1763 he left his native place, and settled in Aberdeenshire, on a farm called Monkshill, consisting of 1300 acres of land almost wholly in a wild state. It was while residing here that he made his first attempt as a public writer in a series of essays on Planting, which he contributed, in 1771, to the *Edinburgh Weekly Magazine*, under the signature of Agricola. These essays he collected and published together in 1777. From this time both his communications to periodical works and his separate publications were very frequent. In 1780 the degree of Doctor of Laws was bestowed upon him by the university of Aberdeen. Three years after he left Monkshill, and came to reside in Edinburgh. In 1784, in consequence of a pamphlet which he had printed on the Encouragement of the National Fisheries, a subject which he had some years before discussed at greater length in a quarto volume, he was employed by government to make a survey of the western coast of Scotland, with a reference especially to that object. In 1791 he commenced the publication of a periodical miscellany under the name of the *Bee*, which had great success. In consequence, however, of a disagreement with the publishers, it was dropped in 1794. In 1797 Dr. Anderson came to take up his residence in the neighbourhood of London; and, in April 1799, he established here a new periodical under the title of *Recreations in Agriculture*. It was continued till March, 1802, when it ceased with the completion of the sixth volume. Dr. Anderson died on the 15th of October, 1808, having been for some years before much broken down through the effects of the intense literary labour of many years. The list of his numerous publications attests the extraordinary activity of his mind; and most of his writings evince great fulness of thought, extensive and varied information, and some of them no slight degree of ingenuity and originality. Dr. Anderson is now acknowledged to have been the first who propounded the theory of the origin and progressive increase of rent, which was almost simultaneously reproduced in our own day by Mr. Malthus and Sir Gilbert (then Mr.) West, and is commonly distinguished by the name of the late Mr. Ricardo, who is known to have been in possession of it two years before the publications of these writers appeared, and by whom also it was afterwards elaborately illustrated. Anderson's statement of the doctrine is to be found at p. 401 of the eighth volume of his *Recreations in Agriculture*, published in 1801. It is as perspicuous, accurate, and complete an exposition of this view of the question as any that has been since given. There can be no question also that to the zeal and labours of Dr. Anderson, much more than to any other individual, is owing the greatly increased attention to the subject of agriculture which, in Scotland especially, has grown up since he began to write. In this way he has been a distinguished benefactor to his country. A complete catalogue of his writings may be found in the authorities quoted below. They consist of between twenty and thirty separate works, besides numerous contributions to the *Encyclopædia Britannica*, the *Monthly Review*, and various other periodicals. To the first edition of the *Encyclopædia Britannica* he contributed the articles Language, Monsoons, and Sound. Among his other works are, a *Practical Treatise on Chimneys*, duodecimo, 1776.—*Free Thoughts on the American Contest*, octavo, 1776.—*Essays relating to Agriculture and Rural Affairs*, octavo, 1777 —*Observations on Slavery*, quarto, 1789. — *Two Letters on a Universal Character*, octavo, 1795.—*Selections from Correspondence with General Washington*, octavo, 1800.

ANDERSONIAN INSTITUTION. [See GLASGOW.]

ANDES, the general name given to the great range of mountains which runs along the western side of the continent of South America. In the languages of the Incas, these mountains are called *Antis*, and as they abound in copper and other metals, Humboldt is of opinion that the name is derived from the Peruvian word *anta*, which signifies copper, and metal in general. We apply, in Europe, the term Andes to the whole range, but it is unknown to the inhabitants of the countries north of the equator. These mountains are called by the Spaniards, Cordilleras de los Andes, or the Chains of the Andes, whence the word Cordilleras alone is sometimes applied to them.

In considering these mountains as a great feature in the physical structure of the earth, we may fix their southern extremity in the rocky islands of Diego Ramirez, off Cape Horn, in lat. 56° 30′ south, and their northern termination in the 69th of north latitude, at the mouth of the Mackenzie River. There is probably an almost unbroken chain throughout the whole of that vast space, which is more than one-third of the circumference of the globe. It is difficult to say where the real chain of the Andes commences. It continues, however, when once formed, without a break, to the mouth of the river Atrato, or the isthmus of Darien, which pours its waters into the Caribbean Sea, in lat. 8° 15′ north, a distance, reckoning the whole line, from Diego Ramirez, of 64° 15′ of latitude.

The Andes of South America, although, in our maps, they look like one long, single ridge, are by no means so, but are composed of a series of chains of mountains, more or less parallel, inclosing vast elevated plains, or table-lands, and of several great groups, like knots or articulations, at distant intervals. The average width of their base is extremely narrow, considering their great length, in comparison with that of most other extensive systems of mountains; for, except where the groups just mentioned occur, the breadth varies only from sixty to seventy miles. The greatest extension, from east to west, is between the parallels of 15° and 18° south, in one of the groups, where a base line perpendicular to the axis of the chain would be nearly 400 miles in length.

The whole surface of South America is broken by four great systems of mountains, viz., the Andes; the mountains of Venezuela, running nearly at right angles to the Andes, and parallel with the Caribbean Sea; the mountains of Parime or Guiana, on the eastern side of the continent, between the rivers Orinoco and Amazon; and the mountains of Brazil, between the Amazon and the Rio de la Plata. The proportion, however, of mountain to plain is not greater than as one to four. The Andes contain 58,900 square leagues, and rise like a vast wall along the western side of the continent, separating the plains drained by the Orinoco, Amazon, and Rio de la Plata, which occupy a space of 424,600 square leagues, from the narrow country between their western base and the Pacific Ocean, which does not contain more than 20,000 square leagues. For the convenience of description, we shall divide the range of the Andes into four parts, marked by the political divisions of the continent, and shall call them the Andes of Patagonia, of Chili, of Peru, and of Colombia.

The *Andes of Patagonia* extend from the fifty-sixth to the forty-second degree of south latitude, or about 970 miles. Cape Horn, which may be seen distinctly at sixty miles' distance, is estimated to be about 3000 feet high. The greatest heights in the largest of the three chief islands (King Charles's South land), composing the Tierra del Fuego, lie about the centre of the strait of Magalhaens: Mount Sarmiento is covered with snow all the year. According to Captain King, the line of perpetual snow in the straits is about 3500 or 4000 feet above the sea. Between Chiloe and the strait of Magalhaens the average height of the mountains does not exceed 3000 feet, though, according to Captain King, there are some which may be five or six thousand feet high.

South of the parallel of 40°, the Andes, instead of leaving a belt of land between their base and the sea, press close on the ocean, and thus assume a new character which they retain to the very extremity of the continent, when we consider, as we ought to do, that their line of continuity must be looked for in the islands of the south-west coast. North of 40°, we find a 'long unbroken shore, affording neither shelter for vessels nor landing for boats; but to the southward of that parallel, the waters reach to the very base of the great chain of the Andes, and flowing, as it were, into the deep ravines that wind through its ramifications, form numerous channels, sounds and gulfs, and, in many instances, insulate large portions of land.' (Capt. King.) The charts of the Tierra del Fuego, and of the south-west coast of America, made during the late survey under Captain King, enable us to form a more correct notion of the Patagonian Mountains, and somewhat to rectify former delineations and descriptions of them. Without entering at present on a particular consideration of the mountains of Tierra del Fuego, which require a separate examination, we may trace from the bottom of Admiralty Sound (in King Charles's Land), rugged and snow-covered mountains, running in a general westerly direction, till we come to Mount Sarmiento (54° 25′ S. lat.) on the east side of Magdalen Sound, rising to the height of 6800 feet, and covered with perpetual snow. Mount Sarmiento belongs to the mountains that skirt the south side of the Gabriel channel; the whole are supposed to be the most elevated land in the Tierra del Fuego. An extensive glacier surmounts this range that runs along the Gabriel channel.

The extreme point of the South American *continent*, Cape Froward, (53° 53′ 43″ S. lat., 71° 14′ 31″ W. long.,) rises abruptly from the sea and terminates Brunswick Peninsula, which is a mass of high mountainous land, attached to the continent by a narrow neck of low country. It appears that the Strait of Magalhaens, from Cape Virgins westward to the isthmus of the Brunswick Peninsula, following the northern shore of the mainland, exhibits undulating hills, plains with level-topped land rising from them, and extensive levels frequented by the guanaco and the ostrich, but no mountains. Thus we see that the Pampas extend to the very verge of the strait. No rivers enter this part of the strait from the mainland. If we cross the isthmus of Brunswick Peninsula westward into the Otway, and then into the Skyring water, we find both these waters bounded on the north by low land, and no mountains visible. The Cordillera of the Andes, therefore, does not terminate in the mainland; we must look for it in that strange assemblage of large and small islands, intersected by almost countless channels, which run northward from the Tierra del Fuego, and form a broad belt in front of the Patagonian coast as far as the Peninsula of the Three Mountains. We must trace them also in the deep indentations and fjords, by which the sea enters far into the mainland, and gives to this part of the South American coast a character resembling that of the coast of Norway.

From Mount Sarmiento, a line drawn about N.W. by W. over numberless inlets, snow-topped mountains and glaciers, brings us to the southern part of Queen Adelaide's Archipelago. Ascending to Smyth's channel, between this Archipelago on the west, and King William IV.'s Land on the east, we find Mount Burney (52° 20′ S. lat.) on the right side of the channel, rising to the height of 5800 feet. The slope from the base northward towards the Ancon sin Salida of Sarmiento, appears as an extensive glacier. Mount Burney is near the southern entrance of the opening called by Sarmiento 'Ancon sin Salida,' which forms the inlet to those numerous sounds and canals, by which the sea runs into the mainland, behind the Archipelago and islands that line the western coast. The first great channel which runs nearly due north, called the Canal of the Mountains is, in fact, a longitudinal valley of the Cordilleras. It is forty miles long, with an average breadth of one mile and a half, bounded on each side by the lofty snow-capped Cordilleras. The western side is much the higher, and has a glacier twenty miles long running parallel to the canal. The southern part of the glacier commences about 52° S. lat.

Due east of the Canal of the Mountains, and separated from it by intervening sounds and highlands, we find the east shore of Disappointment Bay, to which also access is obtained by the Ancon sin Salida. The *east* coast of this bay is flat and low, and the land runs eastward in extensive plains covered with herds of deer. Thus we see that the Cordillera in the lat. of 52° does not appear, strictly speaking, on the mainland. To trace with accuracy the course of the mountains farther north is impossible, for want of more precise information; but we must remark that the extreme *western* shore of the islands which cover this coast is often rocky and mountainous. Cape Isabel (51° 51′ S. lat.), Cape Santiago, the S.W. entrance of the Madre di Dios Archipelago, and Cape Three Points, the N.W. point of the island of Madre di Dios, are bold projecting masses. Cape Three Points (50° 12′ S. lat.) is a lofty rocky mountain, with an elevation of near 2000 feet, rising into peaked summits. Cape Primero (49° 50′) is the S. point of the mountainous island of Corso, the land of which in clear weather may be seen for ten leagues from the southward. All these points are remarkable projections of the western Patagonian coast; for we must consider the parts that face the ocean as the real coast line, which is of a bold and rocky character, and broken up into an infinite number of fragments by the waters that penetrate deep into the interior and insulate large masses of the higher lands.

As we advance north from Disappointment Bay, it appears that the Cordilleras begin to get a footing on the mainland, which is shown by the high land observed on the east side of the gulfs and sounds, and by the numerous glaciers that sometimes run along their *east* sides, and sometimes are found at the *termination* of the long creeks and inlets. These glaciers are marked in the charts as occurring at numerous points along the eastern shores of the deep inlets, from the great Canal of the Mountains as far as Kelly Harbour (47° S. lat.), a little south of the San Tadeo River in the Gulf of Peñas. We may form some idea how close the Andes still press on the ocean even here, by the fact that Kelly Harbour is surrounded by lofty mountains, from 1400 to 1800 feet high, and by ice-filled valleys and ravines. A few birds and hair seals, but no trace of man or any other animal, was seen in this dreary place. A little north of Kelly Harbour is the San Tadeo river, which, though only navigable for eleven miles, is the largest river of the coast, *south* of the archipelago of Chiloe. The glaciers, no doubt, pour into the creeks and inlets abundance of fresh water, but are not far enough removed into the interior to give birth to rivers.

From the southern extremity of Wellington Island (50° 5′ S. lat.), which is the largest island that lines this coast, being about 138 miles long, a range of high land runs northward into the island. The highest point, called Cathedral Mount, from its resemblance to the spire and body of a church, may be seen at the distance of twenty leagues. It appears probable, then, that the Cordilleras here, as well as in their more northern course, consist of various parallel chains, running generally north, and forming, by the depressions and channels between them, a series of low lands, valleys, and channels into which the sea has penetrated.

Those who have not the opportunity of seeing Captain King's charts, and his book of sailing directions, will find a good general description of this coast by the same officer, in the *London Geographical Journal*, Vol. I.

The circumstance of mountains in this part of the Andes being covered with perpetual snow does not afford any certain guide for determining their height, if compared with mountains within the same latitudes in Europe, such as the Pyrenees and the Alps; because the limit of perpetual snow descends as we approach the pole much more rapidly than it does in the northern hemisphere. Thus, in the island of Georgia in the Southern Ocean, which is situated between the fifty-third and fifty-fourth parallels of latitude, corresponding to the latitude of central England, the line of perpetual snow comes down to the sea-shore, rendering the island, which is ninety miles long and thirty broad, wholly uninhabitable.

The *Andes of Chili* lie between the forty-second and twenty-fourth degrees of latitude, an extent of about 1200 miles. No accurate measurements have been made of the loftier summits, and all we know on this subject is very vague. Tupungato, in lat. 33° 24′, is considered the highest point of this part of the Andes, and no snow can be seen on its summit during certain periods of the year. Now Humboldt estimates the limit of perpetual snow in latitude 33° at 12,780 feet; and if this be correct, Tupungato cannot be the highest point in the Andes of Chili, for the pass of El Portillo, by the barometrical measurement of the author of the article Chili, in the *Encyclopædia Britannica*, is 14,360 feet above the sea. That same author supposes this part of the Andes to rise as high as 17,000 feet. South of Tupungato, in latitude 35°, there is another lofty mountain called El Descabezado, which probably got its Spanish name (signifying *beheaded*) from its truncated summit, on which there is a plain six miles in diameter.

There are several passes across the ridge, the most important of which are those on the great line of road between the city of Buenos Ayres and the port of Valparaiso on the Pacific. These mountain-passes lie between the city of Mendoza in the eastern plain, and Santiago, the capital of Chili. From Mendoza, which, according to the measurements of Bauza and Espinosa, quoted by Humboldt, is 700 toises or 4486 English feet above the level of the sea, to La Cumbre, (that is, the summit,) the road ascends to the height of 12,700 feet, and from thence there is a gradual descent to the city of Santiago, which is 2614 feet above the Pacific.

Between the thirty-third and twenty-fourth degrees of latitude, two great mountain-chains form as it were buttresses on the eastern side of the range, being the most southerly of those articulations we have spoken of. The one, called the Sierra de Cordova, lies between the thirty-third and thirty-first degrees of latitude, advancing like a promontory into the pampas (plains) of the Rio de la Plata, as far as the sixty-fifth degree of longitude; the other, called the Sierra de Salta, which has a general direction parallel to the other, lies between the twenty-eighth and twenty-fourth degrees of latitude, and extends eastward to the sixty-fourth degree of longitude, or about 400 miles from the axis of the Andes. In neither of these offsets do the mountains rise to any considerable elevation.

In the Chilian Andes the steep face is on the eastern side, to which there is not a progressive ascent, as on the western side from the Pacific.

Between the western foot of the Andes of Chili and the sea, the face of the country is diversified with several low ridges of hills, gradually diminishing in height as they come nearer the coast, and intersected by the numerous streams which flow from the mountains. Some of these are branches from the central ridge, others run parallel to it, but the highest do not exceed 2500 feet above the sea. The breadth of the Andes in this part of their course is very various; the broadest part is between Mendoza and Santiago, and it is probably not less than 140 miles.

The *Andes of Peru* comprehend that part of the range between the twenty-fourth and sixth degrees of south latitude, a space of about 1250 miles. Their southern extremity is situated in the modern republic of Bolivia, which includes the antient provinces of Upper Peru. The great mountain-system, from the straits of Magalhaens to the parallel of Arica, in 18° 28′ S. lat., has a uniform direction from south to north, never deviating more than five degrees east; but from that point it turns suddenly to the N.W. and continues in the same direction until it reaches the fifth degree of latitude, when it again suddenly changes to N.E., the line of coast following the inflections of the mountains; thus the northern extremity of the Andes of Peru lies two degrees of longitude west of the southern termination. Between the nineteenth and twentieth degrees of latitude, not far from the city of Potosi, the range separates into two great branches, now called the Eastern and Western Cordilleras of Bolivia. The eastern Cordillera continues in a northerly course, with an inclination to the west, for about 500 hundred miles, terminating in a plain watered by the Paro, one of the great feeders of the Amazon; and in this Cordillera the Andes attain their greatest elevation. Chimborazo, about 80 miles south of the city of Quito, was long considered to be the loftiest point in the whole range, being, according to Humboldt, 3350 toises, or 21,436 feet above the level of the sea; but if the trigonometrical measurements of Mr. Pentland are to be relied on, there are two mountains in the eastern cordillera of Bolivia which are considerably higher, viz. the Cerro Nevada de Illimani, eastward of the city of La Paz, which is 24,350, and the Cerro Nevada de Sorata, which is 25,250 feet above the sea.

We have mentioned the two great buttresses of the Andes of Chili, the Sierra de Cordova and the Sierra de Salta; a third, and one of far greater extent, occurs between the twenty-second and seventeenth degrees of latitude, called the Sierra Nevada de Cochabamba. It constitutes a great lateral branch, which separates from the main range of the Andes, between the cities of La Paz and Oruro. The general direction of the mountains composing this vast group is from west to east, and they form on this part the water-shed of rivers which run on one side into the Amazon, on the other into the Rio de la Plata. Their eastern slope is very rapid, and their most lofty summits exceed the limit of perpetual snow, which is here 14,700 feet above the sea, and these are situated in the northern part of the group. Between the fourteenth and fifteenth degrees of latitude the eastern and western Cordilleras of Bolivia unite, and form the great mountain-group of Cuzco. By the bifurcation and this subsequent reunion of the range, a vast table-land is inclosed at an elevation of 12,700 feet above the sea, containing an area of 3500 square leagues, covered with fruitful fields and populous towns. It contains the great Lake of Titicaca, the surface of which extends over 448 square leagues, and, according to Humboldt, is more than twenty times as large as the Lake of Geneva. This table-land or basin is inclosed on every side, and there being no outlet, the waters which flow down from the surrounding mountains into the lake must be carried off solely by evaporation from its widely-extended surface.

The group of Cuzco, so called from the city of that name, on its eastern boundary, is by far the most extensive of those lateral assemblages of mountains which occur at intervals along the eastern side of the Andes, having an extent of surface three times as large as the whole of Switzerland, and with a mean height of 8300 feet. Proceeding N.W. from this group, a second bifurcation of the range takes place, near the thirteenth degree of latitude, the eastern chain extending eastward of the city of Guanta, the western holding a course to the west of Guancavelica. They unite again between the tenth and eleventh degrees of latitude, to form the group of Pasco, inclosing another basin, or rather table-land, having an elevation of nearly 11,000 feet above the sea, but not one-half so large as the table-land of Titicaca. In the western chain there are two mountains covered with perpetual snow, called Toldo de la Nieve, (tent of snow,) which are seen from the city of Lima. North of the group of Pasco, the Andes divide into three parallel branches, or subordinate chains, which continue to the frontiers of Colombia, where they unite again in the group of Loxa, about the fifth degree of latitude. The eastern and central chains are of comparatively low elevation, for in no part of their course do they attain the limit of perpetual snow; but the western chain, which runs along the coast, has the three snow-clad summits of Pelegatos, Moyopata, and Huaylillas. Between this last mountain, situated near Guamachuco, in latitude 7° 55′, and Chimborazo, a distance of more than 400 miles, the Andes rise in no part to the height of the perpetual snow limit. Between the mountain-range and the western ocean, the low country of Peru is very narrow, rarely exceeding 50 miles.

The *Andes of Colombia.*—At the northern limit of the group of Loxa, between the third and fourth degrees of south latitude, the main range divides into two subordinate chains, or cordilleras, which inclose the longitudinal valley of Cuença by their uniting in latitude 2° 27′ to form the group of Assuay, which last contains a table-land, or plateau, at an elevation of 15,520 feet, almost within the region of perpetual snow. Beyond this group another bifurcation takes place, the eastern cordillera containing the great mountains of Chimborazo (21,415 feet) and Yliniza (17,386); the western cordillera containing the mountains of Sangay and of Cotopaxi (18,858). The chains unite in the narrow ridge of Chisinche for a short distance, but spread out again shortly afterwards to form the vast table-land of Quito, which is bounded by stupendous mountains on the east side, and is inclosed by the reunion of the chains at the volcano of Imbabura, in latitude 0° 20′ N., near Villa de Ibarra. In the eastern cordillera are the mountains of Antisana (19,126 feet) and Cayambe (19,625); in the western, are Pichincha (15,924) and Cotochache (16,428). These chains inclose a table-land, which is divided longitudinally by low hills, and on the east of these are the plateaus of Puembo and Chillo; on the west, those of Quito, Iñaquito, and Turubamba. The equator passes through a village in the valley of Quito. In no part of the Andes are there so many colossal mountains brought together as on the east and west of this vast table-land of the province of Quito, one degree and a half to the south, and a quarter of a degree to the north of the equator.

The reunion of the cordilleras near Villa de Ibarra forms the group of Los Pastos, north of the table-land of Quito, in which are situated the volcanos of Cumbal, Chiles, and Pasto. The general direction of the Andes from the northern extremity of the table-land of Quito to the neighbourhood of the city of Popayan, changes from N. 5° E. to N. 36° E., following the direction of the coasts of Esmeraldas and Barbacoas. North-east of the city of Almaguer, the great range again divides, and the subordinate chains do not unite again. The eastern branch spreads out to form the group called Paramo (desert) de las Papas, in which are situated the sources of the Magdalena, and its tributary the Cauca; and in latitude 2° 5′, this group sends off two branches, by which we have the Andes now divided into three subordinate chains, viz., the eastern and central cordilleras of New Granada, springing from the Paramo de las Papas, and the western cordillera of New Granada, which has continued in an unbroken ridge from the bifurcation of the main range near the city of Almaguer. The eastern cordillera extends towards Santa Fe de Bogota and the Sierra Nevada de Merida, east of the Magdalena river: the central cordillera runs parallel with the eastern to the fifth degree of latitude, forming with it the sides of the valley of the Magdalena, and it continues to divide that river from the Cauca until their junction in latitude 9° 23′. The western cordillera separates the valley of the Cauca from the low country of Choco, which last forms the eastern shores of the gulf of Panama. In the central cordillera is the celebrated pass of Quindiu, between the cities of Santa Fe de Bogota and Popayan. Between the second and fifth degrees of latitude there are many places where the mountains rise above the region of perpetual snow; the most elevated are the Pic de Tolima, in latitude 4° 46′, which is 18,314 feet, and is the highest point in the range of the Andes north of the equator. But, in no part of the eastern cordillera, within the same degrees of latitude, is there any height which exceeds 12,700 feet; in latitude 5° 50′, however, there are the snowy summits of Chita, and in latitude 8° 12′ those of Muchuchies, and it is only in this eastern cordillera that any mountains rise to the perpetual snow limit beyond the fifth degree of latitude. The slope of this cordillera is extremely rapid to the east, where it bounds the basin of the Meta and Orinóco, but on the western side there are several abutments, in the form of great plateaus, or table-lands, and on these are situated the cities of Santa Fe de Bogota, Tunja, Sogamoso, and Leira. They have an elevation of from 8300 to 9000 feet. The western cordillera of New Granada is low, compared with the eastern and central,—the highest point, the Pic de Torra, situated S.E. of the city of Novita, not rising to the limit of perpetual snow. There is a gradual fall of the chain to the mouth of the Atrato on the Caribbean Sea, where there is a complete termination of the great mountain-range of South America; between Cupica, a small sea-port in the province of Biruquete, on the Pacific, and the Rio Naipi, which falls into the Atrato 45 miles above its mouth, there is nearly a dead flat, at least the plain is unbroken by any perceptible ridge.

The range of the mountain-system of the Andes may be said to terminate towards the east, where the eastern cordillera of New Granada, or what has been called the Andes of Cundinamarca, form the Sierra Nevada de Merida; but they are united to the mountains, which run from west to east along the coast of Caracas, or Venezuela, by the four Paramos of Timotes, Niquitao, Boconò, and Las Rosas, which are from 8000 to 10,000 feet high. The mountain-system of Venezuela extends 500 miles, from the Andes of Cundinamarca to the gulf of Paria, and, like the great range of the Andes, is composed of a series of parallel chains inclosing longitudinal valleys, or table-lands, at great elevations. The Silla de Caraccas is the loftiest point, and rises 8630 feet above the sea. [See AMERICA.]

North of the central cordillera of New Granada, and in the midst of a great plain which extends from the delta of the Rio Grande de la Magdalena to the sea lake of Maracaybo, there rises a vast insulated group of mountains called the Sierra Nevada de Santa Marta. They extend about 45 miles from west to east, and their highest summits—El Picacho and La Horqueta—rise beyond the limit of perpetual snow. No exact measurements of these heights have been made, but Humboldt estimates the most elevated to be 19,000 feet above the level of the sea.

The higher regions of the Andes present themselves under three different forms:—the active volcanos, such as Cotopaxi, which have only one crater of vast dimensions, are conical mountains, with summits more or less truncated. Those which have been torn by a long succession of eruptions have a jagged outline, being composed of numerous sharp points, like what are called needles in the Alps. The third is the rounded form, like Chimborazo, the most majestic of all, which, when seen from the Pacific, in a clear state of the atmosphere, stands prominently out from all the surrounding mountains, and towers proudly on the coast of the Andes, like the dome of St. Peter's looking down upon the antient monuments of the Capitol. The Andes appear as a chain only when seen from a distance. When we are placed within the range, as in the table-land of Quito, we see an assemblage of insulated mountains rising from the plateau. Thus all those volcanic peaks, such as Pichincha, Cayambe, and Cotopaxi, although they have separate names, constitute, for more than half their height, one mass, but they appear to the inhabitants of the table-land of Quito as distinct mountains rising out of a plain. The great elevation of such table-lands makes it difficult to believe the height of the mountains to be so considerable. Thus Chimborazo is 273 feet less in elevation above the plateau from which it rises than the summit of Mont Blanc is above the valley of Chamouni, and mountains, which would astonish us by their height if they rose at once from the sea shore, look like low hills on the Cordilleras. Humboldt and Bonpland endeavoured, but without success, to reach the summit of Chimborazo; they ascended, however, to the height of 19,280 feet,—a greater elevation than had ever been trod by man in any part of the world, and 3546 feet higher than the top of Mont Blanc.

Among the majestic and varied scenes which the Cordilleras present, says Humboldt, the valleys produce the most striking effects upon the imagination of the European traveller. The enormous height of the mountains cannot be seen as a whole except at a considerable distance, and when we are in the plains which extend from the coast to the foot of the central chain. The table-lands which surround the summits covered with perpetual snow are, for the most part, elevated from 8000 to 10,000 feet above the level of the ocean. That circumstance diminishes to a certain extent the impression of grandeur produced by the colossal masses of Chimborazo, Cotopaxi, and Antisana, when seen from the table-lands of Riobamba and Quito. But it is not with the valleys as with the mountains: deeper and narrower than those of the Alps and Pyrenees, the valleys of the Cordilleras present situations so wild as to fill the mind with fear and admiration. They are formed by vast rents, clothed with a vigorous vegetation, and of such a depth that Vesuvius might be placed in them without overtopping the nearest heights. Thus, the sides of the celebrated valleys of Chota and Cutaco are 4875 and 4225 feet in perpendicular heights; their breadth does not exceed 2600 feet. The deepest valley in Europe is that of Ordesa in the Pyrenees, a part of Mont Perdu; but this, according to Ramond, is not more than 3200 feet deep.

The Andes contain the sources of the greatest rivers of the world, the Amazon, and the La Plata, besides many others of considerable extent, such as the Magdalena and Orinoco; but on the western side of the continent, owing to the proximity of the mountains to the sea, there is no river of any magnitude.

Geological Structure.—We are indebted for nearly all the information we possess on this subject to the Baron Alexander Von Humboldt, but, for reasons which we shall presently show, what he has told us conveys little more than a general knowledge of the existence of certain classes of rocks and minerals. When that illustrious traveller left Europe to visit South America, geology was in a very different state from that in which it now is. He had been educated at Freyberg under Werner, in a school where mineralogical characters were too exclusively dwelt upon as a principal test for determining the ages of rocks, and where theoretical opinions, founded on extremely limited observations, prevailed too much. The organic remains contained in the strata were treated as of subordinate importance, the determination of species among these had scarcely been attempted, and thus the great principle now acted upon of determining the order of succession of the stratified deposits, not by the mineral composition of the rock, but by the species of the organic remains which it contains, was almost unknown; and the grand division of the stratified formations termed Tertiary, has been established by the discoveries of geologists since the period when Humboldt returned from South America. We have therefore to regret that many of the observations of that accomplished traveller are unavailable in the present more advanced state of geological science on account of their being described in the theoretical language of the Freyberg school, and having reference to doctrines of Werner, which later observations have proved to be untenable. When, in describing the unstratified rocks, he speaks of *old* and *new* granites, of primitive and transition syenites and porphyries, the terms are scarcely intelligible to a modern geologist, or at least convey to him no facts upon which general reasonings with regard to the rocks themselves, or the strata with which they are associated, can safely be founded. But the zoological characters of strata spread over so vast an extent of country could only be adequately described by the united labours, during a long period of observation, of many geologists, previously well instructed in all the knowledge of modern times respecting organic remains, and it is therefore no reproach to Baron Humboldt if he has left that field unexplored. Geology formed also but a part of the many objects which engaged his attention; and when we trace the line of his route, and compare his opportunities of personal observation with the extent of country which he never saw, we discover at once that all he could tell us is but a small portion of the geological phænomena of that vast region. If it has required years of the exertions of many labourers to arrive at our present knowledge of the geology of Europe; if a single volcano, like Ætna, has occupied the attention of naturalists for half a century, the observations of the latest inquirers bringing to light important facts unnoticed by their predecessors, what could be expected from the single visit of a single individual, however great his powers, to a whole continent of volcanoes, many of which greatly surpass Ætna itself in magnitude? Of this Humboldt was himself fully aware, for he says, (*Vues des Cordillères*, p. 4) 'Ages would not suffice to observe the beauties and discover the wonders which nature has lavished over an extent of two thousand five hundred miles,* from the strait of Magellan to the coast bordering on eastern Asia. I shall believe that I have attained my object, if the feeble sketches contained in this work shall excite other travellers to visit the regions I have traversed.' He is here speaking, it is true, of natural scenery, but we may reasonably suppose that he would say the same regarding all the other natural objects of his research. In everything which relates to the exact determination of the ages of the sedimentary deposits; the changes of position which they have undergone; *the* organic remains which they contain; the alluvial accumulations of every period; the relative ages of the unstratified and volcanic rocks to each other, and to the strata with which they are associated, in short, with regard to almost all the most important phænomena upon which the general principles of the science of geology depend, the Andes, and, indeed, the whole continent of South America, may be considered as remaining still an unexplored field. We are far from undervaluing the labours of Humboldt; on the contrary, we have always looked with admiration and astonishment at what he accomplished, both by his own observation and by the skilful manner in which he has made use of materials obtained from others. But it is important for the cause of science that too ready an assent should not be given to the sweeping generalizations which have sometimes been attempted to be drawn from his observations; for a more deliberate investigation will show that all we learn from the perusal of his works, respecting the geology of South America, does not amount to much more than a knowledge of the existence of certain great classes of rocks, in the northern half of the continent, in so far as their mineral composition is concerned, and a broad outline of their relative positions; together with some interesting particulars concerning the great features of volcanic action on a stupendous scale. Humboldt, by those researches, must ever be considered as having made a most important contribution to geological science. From the materials scattered through his various works, and from a few hints supplied by others, we have been enabled to draw up the following brief sketch of the geology of the Andes, as well as most of that which we have said upon the general forms and bearing of the mountain-range. Such of our readers as wish to investigate the subject more fully than we are able to do in this place, consistently with the plan of the work, must go to the original sources, especially to the volumes of Humboldt, where they will find an abundance of matter the most varied, instructive, and entertaining.

The researches of Humboldt did not extend beyond the provinces of Upper Peru, so that our knowledge of the structure of the Andes of Chili and Patagonia is extremely scanty. Travellers speak of meeting in their routes across the mountains with granite and mica-slate, and clay-slate, porphyry, sandstone, and so forth; and the low countries between the shores of the Pacific and the base of the Andes is said to be composed of secondary rocks, including beds of coal. How little geological information such notices convey it is unnecessary for us to point out. Thus two thousand miles of this vast mountain-range, containing, no doubt, the most curious and important geological phænomena, may be said to be almost wholly unknown to us. Tierra del Fuego, or the 'land of fire,' may naturally be supposed to have taken its name from volcanoes having been seen on it; but, except that which Captain Hall saw at a distance in a state of activity, in 1822, no other is known. This volcano is placed near the Beagle Channel, (54° 48′ S. lat., 68° W long.) and still rests on the sole authority of Captain Hall. The range of the Andes, as we have remarked, if we consider the mountains of Tierra del Fuego to belong to them must be looked for in the western part of the largest island forming the group of Tierra del Fuego, called King Charles's South Land, and in the adjoining westerly islands of Clarence and Desolation. Magdalen Sound, which divides King Charles's Land from Clarence Island, separates also the clay-slate from the more crystalline rocks of Clarence Island, which are greenstone; and, on the east side of Clarence Island, mica-slate. The clay-slate contains Mount Sarmiento, already referred to, and east of it, Mount Buckland, which is described 'as a pyramidal block of slate, with a sharp-pointed apex, and entirely covered with perpetual snow.' Its height is stated at about 4000 feet. This slate formation, which occupies the centre of the strait, contains long valleys, often furnished with a rich mould, and producing trees of considerable dimensions. The region east of the clay slate, at least along the north shore of the strait, produces nothing but grass; and that west of it, only stunted trees. It is also remarkable, that the innumerable small islands which characterize the western parts of the strait are not found in the slate formation. This formation extends from Cape Famine in Brunswick Peninsula, across the strait, and along the Gabriel Channel and Admiralty Sound, in a direction E. S. E., and possibly continues to Cape Success, at the strait Le Maire. The east shore of Tierra del Fuego partakes of the character of the Patagonian Pampas. The south shores of Hoste and Navarin islands, which also belong to the Tierra del Fuego group, are hornblende, which is also the chief component part of Cape Horn.

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* German miles.

Clarence Island is of a more rugged form than King Charles's Land, and tolerably verdant; in the Barbara channel, which separates it from Desolation Island, the fragments of rocks which compose the small islands are thickly strewed, and form the transition to the rough granitic mountains of the western part of Magalhaen's strait. The highest mountains, as we have observed, are in the slate formation, on the western side of King Charles's South Land. (See the articles STRAITS of MAGALHAENS and TIERRA DEL FUEGO; and Captain King's *Charts*.)

Volcanos are said to exist in the Andes of Patagonia; and of these there are mentioned San Clemente in lat. 46°, Medialara in lat. 44° 30′, and Minchimavidar in lat. 43°. The most remarkable feature in the physical constitution of the Andes of Chili is the great extent of volcanic action that has existed in past ages and is still in operation. No less than nineteen points of eruption, situated in a continuous line from south to north, that is, in the direction of the range, which have heaped up their ejected matter so as to form lofty mountains, have received distinct names, and there are probably many more of no inconsiderable importance which are still unknown. The most remarkable of the volcanoes of Chili are Villarica in lat 39° 8′, Maypu in lat. 34° 10′, and Peteroa in lat. 35° 15′. Villarica is always in a state of activity, and may be seen, it is said, at a distance of 150 miles. Our more detailed geological description is, from want of materials, confined to the Andes of Peru and Colombia, and especially the latter.

The Stratified Rocks.

GNEISS is found at intervals throughout the greater part of the range, often associated with granite, and often passing into mica-slate. It frequently contains large quantities of garnet.

MICA-SLATE is, next to porphyry, the rock of most frequent occurrence in the Andes, and more especially north of the equator. In the Nevada de Quindiu of New Granada, it attains a thickness of more than 3800 feet; it contains, in some places, beds of granular limestone, occasionally resembling the finest Carrara marble; but limestone, subordinate to gneiss and mica-slate, is a much more rare occurrence than in the Alps and Pyrenees. Not far from Popayan, it contains beds of quartz and beds of gypsum, sulphur being found in the quartz, and in one place Humboldt observed a bed of lamellar graphite. It often passes by insensible gradations into clay-slate.

CLAY-SLATE occupies a space of small extent in the Andes. North of the equator, it is found immediately under secondary formations in the table-land of Santa Fe de Bogota, and south of the equator it serves as a basis to the porphyry in the Andes of Quito. It is found immediately beneath a secondary limestone at the height of 12,800 feet in the ridge of the Andes of Peru, and rests on granite on the western declivity of the same part of the range: but Humboldt is of opinion that the chief mass of the slate-rocks of South America belongs to the transition series of the Wernerian school, rather than to primary strata.

QUARTZ ROCK. South of Chimborazo, near Hecatacumba, in the Andes of Quito, there occur enormous masses of quartz rock mixed with mica. The primitive quartz observed in the mountains of Europe cannot be compared in thickness nor extent to that of South America: on the western declivity of the Andes of Peru, it attains the enormous thickness of 6000 feet, and there and elsewhere it covers many leagues. It contains gold, mercury, and specular iron in many places, and in the celebrated sulphur mountain of Tiscan, in latitude 2° 13′ S., the sulphur is contained in a bed of quartz 1300 feet thick, subordinate to mica-slate, at an elevation of 8000 feet. Gold and sulphur are also found in a quartz rock in the Andes of Peru near Caxamarca, and the celebrated quicksilver mines of Guancavelica in Peru are also in the same rock.

RED SANDSTONE. A red sandstone occurs to a vast extent in the Andes of Peru, and over a great part of Colombia, not only in the Andes, but in the country east of that range, and to the shores of the Atlantic. It is often a coarse conglomerate, and passes through all gradations of structure to that of a fine-grained sandstone. From Humboldt's description of its occurrence at different places, it appears to belong to different ages, to the old red sandstone, or newer beds of the grauwacke series, and to the lower beds of the new red sandstone, the *rothe todte liegende* of the Germans. A red sandstone covers an extent of country 25 leagues in length, forming the whole table-land of Tarqui and Cuença in the Andes of Quito, at an elevation of from 8300 to 9600 feet, and it rises in the Paramo de Saar to the height of 12,150 feet, the thickness of the whole mass exceeding 5100 feet. The formation of red sandstone in the province of Quito is generally very argillaceous, sometimes slaty, and alternates with a conglomerate containing fragments of porphyry, and Humboldt found in it trunks of monocotyledonous trees four feet long and fourteen inches in diameter. It also contains there beds of an opaque limestone, and of a saccharoid limestone, like the marble of Carrara. In the llanos (plains) of Venezuela, these immense steppes, or mountain-plains, uniform like the surface of the sea over an area of 10,000 leagues, which stretch from the Sierra Nevada de Merida to the mouths of the Orinoco, are composed of a series of secondary rocks, the lowest of which is a red sandstone, or conglomerate of rounded fragments of quartz and flinty slate united by an argillaceous cement, sometimes of as vivid a red as cinnabar. This sandstone appears at the surface over the greater part of the llanos, but towards the east it is covered by beds of limestone and gypsum. In New Granada, the slaty fine-grained sandstone occurs to a greater extent than the coarse conglomerate. The latter disappears almost entirely when the formation rises to 5000 feet above the level of the sea; the sandstone of the table-land of Santa Fe de Bogota, at an elevation of 10,780 feet, is composed of small quartzose grains, sometimes so closely united as to give the rock the appearance of a granular quartz; it nowhere displays variegated colours, and animal remains are extremely rare in it. A similar red sandstone occurs in the great table-land of Caxamarca in Peru, at the height of 9350 feet. In the red sandstone of Santa Fe de Bogota, beds of coal are found, and in the great tract of red sandstone, between the lower part of the river Magdalena and Santa Fe, coal occurs in several places. Coal is also found at Huanuco in Peru, at an elevation of 14,750 feet,—the greatest elevation probably at which coal has yet been discovered. It occurs there in a compact limestone, but whether that is a subordinate formation in the red sandstone does not appear. Humboldt observed, between the seventh and eighth degrees of south latitude, a great formation, which he has called a secondary quartz rock, as it seems to replace the red sandstone on the western declivity of the Andes, and is covered immediately by magnesian limestone. It is a granular and compact quartz, stratified, without organic remains, and attains a thickness of several thousand feet.

The red sandstone of New Granada is covered by lamellar gypsum and by fetid limestone. In the basin of the Cauca and the plateau of Santa Fe, the former being 5750 feet lower than the other, the three formations of sandstone with coal, gypsum, and compact limestone succeed each other very regularly, and at Zipaquira, in the table-land of Santa Fe, rock-salt associated with this same gypsum and limestone has been worked for ages. The saliferous deposit is not less than 830 feet thick, and is covered by great masses of granular gypsum, the red sandstone appearing beneath the saliferous clay. Deposits of rock-salt and brine-springs are of frequent occurrence in traversing the eastern cordillera of New Granada from S.W. to N.E. for a distance of more than 50 leagues. Rock-salt is also found in the Peruvian provinces of Chachapoyas, on the eastern declivity of the Andes, and, what is remarkable, contains there masses of galena or sulphuret of lead. At Huara, on the coast of Peru, between Lima and Santa, rock-salt is worked like marble in a quarry, and at the same place rocks of porphyry pierce through beds of the purest rock-salt. The red sandstone of the llanos of Venezuela is covered by a whitish-grey compact limestone, and above the limestone there occurs gypsum alternating with beds of marl. This limestone, according to Humboldt, is an equivalent of the zechstein of the Germans, the magnesian limestone of English geologists. It is met with in various parts of the Andes of Peru, at elevations from 9000 to 14,000 feet, and it contains beds of bituminous marl slate, with impressions of fish, (as at Mansfeld, in Germany,) near Pasco, in the Andes of Peru, at the height of 12,800 feet. In the mine Santa Barbara, near Guancavelica, an immense bed of sandstone, containing a deposit of mercury, is met with in this same limestone.

It does not appear, from the observations of Humboldt, that any of the secondary strata later than the magnesian limestone occur in any part of the Andes, or the adjoining country, which was visited by him, and he expressly says that he never met with either oolite or chalk. The only tertiary formation he speaks of is one in the table-land of Santa Fe de Bogota, which appears to have been a lacustrine deposit, and in which he found enormous bones of the extinct species called the mastodon. That the whole series of the secondary strata above the magnesian limestone should be wanting, and that there should be a total absence of all tertiary marine beds in one-half of the continent of South America is very extraordinary, and scarcely probable. But notwithstanding this imperfect state of our knowledge respecting that vast country, an eminent French geologist, M. Elie de Beaumont, in his eagerness to generalize a favourite theory,—a theory intended to show a connexion between the elevation of mountain-chains and the extinction of species of organic remains in the successive sedimentary deposits,—has, of late, not hesitated to declare his belief, that the whole line of the Andes must have been upheaved by a single and instantaneous convulsion; that that convulsion was the last which has taken place in the solid covering of the earth, and that, by the agitation which it produced in the ocean, it was the immediate cause of the general deluge. So great a departure from the rules by which philosophical inquiries ought to be guided is a remarkable proof how dangerous, in a progressive science, an attachment to a particular theory may prove,—how very readily arguments with a mere semblance of plausibility will be admitted, even by a man who has worked assiduously in the field of observation, and knows full well how extensive and accurate our observations must be, before any general conclusions can safely be deduced from them.

The Unstratified Rocks.

The most elevated summits of the Andes—the composition of which is known—are either volcanic, or are composed of porphyry. Granite, which, in the old continent, rises to elevations of 15,000 feet, is never found at great heights in the Andes, and, indeed, forms but a small part of their external surface. Humboldt says, that one might pass years in travelling through the Andes of Quito and Peru, almost without seeing it, and he never met with it at a greater elevation than 11,500 feet. It is seen at the foot of the range in the plains of the Orinoco and Amazon, and on the shore of the Pacific between Lima and Truxillo. But Humboldt distinguishes three different kinds of granite, one which he calls primitive, and considers as the foundation upon which all other rocks were deposited, in accordance with the Wernerian hypothesis; another, which he makes of posterior formation to gneiss, but anterior to mica-slate; and a third, older than clay-slate, but of a formation subsequent to that of mica-slate. Modern discoveries have shown that granites, undistinguishable from one another in their mineralogical characters, are associated with some of the most modern of the secondary strata; and these distinctions of Humboldt are founded upon erroneous theoretical views, because the granite that lies under the gneiss may have been protruded to the surface later than that which is associated with the mica-slate. The same observations apply to his old and new syenites,—a variety of granite containing a mixture of hornblende, which is found in several parts of the Andes of Peru and Colombia. Porphyry is, by far, the most widely-extended of all the unstratified rocks of the Andes, and Humboldt distinguishes two kinds,—one which, he says, reposes immediately upon primitive rocks, and is not metalliferous; and another, which is often rich in metals and appears to belong to the transition period. The primitive porphyry is of rare occurrence; it is found on the western declivity of the Andes of Peru, at an elevation of about 3800 feet, and rests immediately upon granite. In the Andes of Peru, Quito, and New Granada, among an innumerable variety of porphyritic rocks, the masses of which are from 16,000 to 19,000 feet in thickness, there is not one which Humboldt considers as belonging to the primitive porphyries. They often exhibit superb columns, as at Pisoje, at the western declivity of the volcano of Purace, where there is a magnificent colonnade, the pillars of which are eighteen feet long, and formed of regular prisms of five, six, and seven sides. They have also very often a globular structure, as if the mass were composed of an aggregation of balls, which separate by decomposition into concentric layers. This globular structure is extremely common in the unstratified rocks of the Andes. To describe the various kinds of porphyries, or even their chief localities, *would* be both tedious and unprofitable; it is enough to say, that *they* occur throughout the whole range of the Andes, at all elevations, and that the highest summits are frequently composed of them.

Next in importance to porphyry among the rocks of igneous origin is that called **Trachyte**, (from τραχὺς, *trachus*,) rough, because it has a harsh, rough feel. There are many varieties of it, but its most characteristic form is a hard rock with a granular basis of glassy felspar, and including separate crystals of glassy felspar usually with a mixture of hornblende, and often mica; and these materials are united in so many different proportions as to produce rocks of very different aspects. Trachytes occur throughout the whole range of the Andes of Chili, Peru, and Colombia; the porphyries are often covered by them, and it is not easy to define the limits between trachytes which pass into porphyry and those which are produced by active volcanos. Like porphyry and basalt, trachyte is often found in columns of great regularity, as in Chimborazo, where it is met with in slender prisms of 50 feet long. It occurs in enormous masses, for Humboldt says that in Chimborazo and Pichincha it undoubtedly attains a thickness of from 14,000 to 18,000 feet, and in continuous masses. The trachytes are most frequently not covered by any other formations except recent volcanic products, and this is also, in general, the case with the porphyries; but these are sometimes covered by the older sedimentary deposits, showing that there are porphyries of very different ages in the Andes; and there is every reason to suppose that trachytes have also been formed at various periods.

The Andes are often throughout a great extent wholly destitute of the trap-rocks: neither in Chimborazo, Antisana, nor Pichincha are there any rocks of this class; but basalt characterised by olivine, and regularly columnar, is found in the table-land of Quito, near Popayan, and on the western banks of the Cauca. The basalt, or trap-formation, in the vicinity of Popayan, as well as in other situations in the Andes, is accompanied by clay of great thickness, which renders the passage of the cordilleras from Popayan to Quito extremely difficult during the rainy season.

Volcanos.

No part of the world has been subjected to greater revolutions from volcanic fires than the range of the Andes. The igneous action has been confined to this western side of the continent, for, east of the Andes, throughout the whole country from the base of the mountain-range to the Atlantic, a space of more than 500,000 square leagues, neither porphyry, basalt, trachyte, nor any active volcanos have yet been discovered, either in the plains, or in the mountains of Guiana and Brazil. In the range of the Andes, where their products do not cover the whole surface, they are found in insulated masses on the ridges and on the sides of the mountains rising in the form of pyramids, or of cones, amidst the stratified rocks of different ages. All the volcanos, whether extinct or active, have burst forth amidst porphyries, basalts, and trachytes; all the loftiest summits of the range are composed of trachyte, and the opening is usually in the latter rock. It may be considered as a general rule, that when the mountains rise much above the limit of perpetual snow, that is, from 14,700 to 15,800 feet in the equatorial regions, the rocks commonly called primitive, such as granite, gneiss, and mica-slate, disappear, and are replaced by porphyries and trachytes. That these last substances are often granite, gneiss, and slates, altered by the action of heat, is rendered probable by many circumstances connected with them, and the trachytes of the Andes frequently include fragments of those primary rocks. It is very difficult to draw the line of separation between the various kinds of unstratified rocks, all of which are now admitted by most geologists to be of igneous origin. Granites and porphyries change into traps and trachytes; these last into the lavas of active volcanos; and thus any conclusions as to the ages of the unstratified rocks, drawn from mere mineralogical differences, are open to many sources of error. The glassy lava, called obsidian, is often met with in the Andes, and exhibits many shades of colour, from deep black to a clear, colourless glass. Beds of it, 16 inches thick, occur in the trachyte of Quinché, in the table-land of Quito. Fragments of rock, including nodules or lumps of obsidian are thrown out by Cotopaxi, and obsidian in the form of balls, and in those elongated pear-shaped forms called tears, is ejected by the volcano of Sotara near

Popayan, to the distance of several leagues, and scattered about like fragments of flint on the chalk-downs. Pumice-stone, which is nothing more than obsidian frothed up by the admission of air or watery vapour to it when it was in a fluid-state, is found to a great extent in many of the volcanos of the Andes; there are immense subterranean quarries of it at the foot of Cotopaxi, and for more than 40 leagues westward of the volcano, the ground is covered with fragments of pumice and cinders of trachytes. Volcanic-tuff, which is a stone more or less compact, made up of fragments of hard lava, cinders, and ashes, agglutinated together, covers immense tracks on the flanks of the Andes and on the table-lands. It is often very friable, and in many places contains blocks of pumice, which are sometimes from 25 to 30 feet long. In a region where almost all the burning volcanos rise above the limit of perpetual snow, deluges of water are often produced by the melting of the snow, and by the bursting of cavities in which water had accumulated by infiltration, and these carry along with them the loose stones, and give rise in lower regions to depositions of this tuff, of a magnitude in proportion to the volume of water and the loose materials it meets with in its descent. A liquid mud sometimes issues from the sides of the volcanos of the Andes, as when, in 1698, the peak of Carguairazo sunk down, and more than four square leagues were covered with mud; and, what is very remarkable, small fish which inhabit the streams of the province of Quito were seen in thousands, enveloped in the muddy eruption. These fish live in subterraneous lakes; at the time of great eruptions the sides of these lakes are burst, the fish are carried with the water through the crevices and are enveloped in the mud formed as the water rushes through the loose ashes and soil. The almost extinguished volcano of Imbaburu ejected in 1691 so great a quantity of fish, that fevers which prevailed at the period were attributed to the effluvia from the putrid animal matter.

The most considerable volcanos of the Andes are situated not far from each other in the province of Quito. These are, Cayambe, Cotopaxi, Pichincha, Antisana, L'Altar, and Tunguragua. Of all the summits of the Andes the height of which has been determined with any degree of precision, the volcano of Cayambe is the most lofty after Chimborazo—being 19,625 feet. Its form, like the volcano called the Nevada de Tolima, is that of a truncated cone, and it is one of the most beautiful and majestic of all those which surround the city of Quito. Its summit is crossed by the line of the equator, and it stands, says Humboldt, like one of the colossal and eternal monuments placed by the hand of nature to mark the grand divisions of the globe. According to a very probable tradition of the Indians of Lican, the mountain called L'Altar, or in the Quichoa tongue, Capa-Urcu, was once higher than Chimborazo, but in the reign of Ouainia Abomatha a prodigious eruption took place, which lasted eight years, and broke it down. The summit of this remarkable mountain presents a series of sharp pinnacles and needles, and when the rays of the setting sun strike upon these ice-clad ruins, the most magnificent play of colours is produced. The volcano of Antisana, which is 19,120 feet high, appears never to have had its summit pierced, the lava having burst forth from an opening in the side. Pichincha, which is 15,920 feet high, has a crater, the edges of which are covered with pumice, but it does not appear to have ejected a current of lava since the formation of the adjoining vallies. The volcano of Cotopaxi is the most lofty of all the volcanos of the Andes which have been in a state of activity in modern times. Its height is such (18,858 feet) that it would exceed by 2600 feet the summit of Vesuvius if that volcano were placed on the top of the peak of Teneriffe. It is the most dreaded of all the volcanos of Quito, because its eruptions have been the most frequent and the most devastating in their effects. In 1738 the flames rose nearly three thousand feet above the edge of the crater. In 1744 the sound of the explosions was so great as to be heard at a distance of five hundred and fifty miles. On the 4th of April, 1768, the quantity of ashes thrown out was so great that in the towns of Hambato and Tacunga such a degree of darkness was produced as to oblige the inhabitants to go about with lanterns for many hours in the day-time. The eruption of January, 1803, was preceded by sudden melting of the snow which covers the mountain. For twenty years no smoke nor visible vapour had issued from the crater, but in a single night the internal fires became so active, that at sunrise the external walls of the cone were observed to be black and bare, their mantle of snow having been dissolved by the heat. The form of Cotopaxi is the most regular and beautiful of all the colossal summits of the Andes. It is a perfect cone, which, covered with an enormous bed of snow, shines with a dazzling lustre at sunset, against the azure vault of heaven. The crater is surrounded with a wall of scoriæ, but it was only seen by Humboldt by means of a telescope, for the cone being surrounded with deep rents and fissures, cannot be approached.

A region so underlaid by volcanic fires could not fail to be subject to repeated earthquakes, and accordingly, no part of the world has suffered more from their dreadful effects. Sometimes the shocks come without giving any warning at all, and ruin and devastation are spread over a district which, an instant before, had been in a state of peaceful repose; in general, however, the inhabitants are forewarned of the approach of the convulsion, but the interval between the announcement and the arrival of the destroying force is too short to admit of any precautions against the loss of property; it is well if there be time enough to escape from death. Such is the frequency of the occurrence, that the inhabitants construct their dwellings so as to diminish the risk of damage to the building, and to facilitate their own escape. But no precautions can give confidence in such a case, and the terror which takes possession of the people extends to the brute creation, for the animals howl piteously when they feel the ground rocking under them. The effects are often produced far from the supposed centre of the volcanic action, for even the towns on the sea-shore are often destroyed. The whole of Chili is particularly subject to earthquakes. The city of Copiapo was entirely destroyed in the year 1819, not a house being left standing; and the city of Conception has been twice destroyed, viz., in 1730 and 1751. An earthquake of tremendous force occurred on the 19th of November, 1822, which shook not only the whole of the low country of Chili, but was felt in the mountains, and even at Mendoza and San Luis, on the eastern side of the chain. The towns of Valparaiso, Mellipilla, Quillota, and Casa Blanca, were almost destroyed, and the capital, Santiago, was considerably damaged. It was felt on the same day at Lima, in latitude 12°, and at Conception, in latitude 37°, a distance of more than 1700 miles. One of the most remarkable effects of this earthquake was the elevation of the land on the coast; above a hundred miles of it was permanently upraised to the height of three or four feet, a portion of the bed of the sea being converted into dry land, covered with oysters, mussels, and other shell-fish. A circumstantial account of the phænomena which occurred near Valparaiso, by Mrs. Graham, who was then living in the country, will be found in her *Journal of a Residence in Chili*, and in the first volume of the *Second Series of the Transactions of the Geological Society*. The volcano of Maypu, situated about 170 miles E.S.E. of Valparaiso, which had been dormant for several years, has had frequent eruptions since the great earthquakes of 1822, for it was not one shock only which took place; many succeeded at very short intervals, even to the end of the following September.

Mines.—No mountains in any part of the globe abound so much in the precious metals as the Andes, both in South America and in the prolongation of the chain northward into Mexico. For three centuries their riches have been spread over every part of the globe to which civilization has extended, and it is probable, that if improved systems of working the mines were introduced, where there are no natural obstacles to their adoption, the produce would be immensely increased.

Gold is seldom found, like other metals, in the solid rock, through which its veins must be followed by extensive subterraneous excavations, nor is it met with in ores, in combination with foreign substances, which can only be separated from the pure metal by long and expensive operations. It is always found in the metallic state, and in a great degree of purity; by far the largest quantity is collected in the form of grains and small rounded lumps, scattered through alluvial soils, which have been derived from the disintegration of rocks containing the metal, and most probably in the form of slender veins. The water-courses of rivers are usually composed of alluvial soil to a great depth, and that soil frequently extends a great way on both sides of the river, the deposits of a long succession of ages; the grains of gold are disseminated through the whole of this alluvium. The places chosen for digging into that auriferous soil are called *lavaderos*, because the gravel, sand, and earth undergo repeated *washings* to separate the heavy particles of gold. The most considerable gold mines of Chili are in the district of Petorea, N.E. of Valparaiso, and farther to the north in the districts of Coquimbo and Copiapo. In Peru, the provinces the most rich in gold are those of Pataz and Huailas, between the seventh and ninth degrees of latitude, and situated in the ridge of the Andes. The Incas obtained vast quantities of gold from the plains of Curimayo, N.E. of the city of Caxamarca, at an elevation of more than 11,000 feet above the sea; and in the Cerro de San José, at a height of 13,000 feet, considerable quantities of gold have been found in veins of an ore of silver. Very extensive and productive lavaderos are situated on the banks of the river Tipuani, not far from the town of Zorata, eastward of the great lake of Titicaca, and which appear to have been worked by the early inhabitants of the country, for antient Peruvian tools are sometimes found in the soil. There are veins of gold in mica-slate in the province of Antioquia in Colombia, but there are no mines worked there, on account of the inaccessible nature of the country. All the gold of New Granada is obtained from the alluvial soils, and the richest lavaderos are in the provinces of Antioquia and Choco, in the valley of the river Cauca, and on the coasts of the Pacific in the district of Barbacoas; but the auriferous alluvium extends over the whole country from the western Cordillera of New Granada to the sea-shore. In some parts of the district the gold is almost perfectly pure, in others it is alloyed with silver in various proportions, even as much as 50 per cent., but this last has been found only in one place. The largest piece of gold known to have been met with in the province of Choco weighed twenty-five pounds; but one is said to have been found near La Paz, in Peru, of nearly forty-five pounds weight. The annual produce of the gold mines and lavaderos of Chili, Buenos Ayres, Peru, and New Granada is stated by Humboldt to have amounted at the beginning of the nineteenth century to 8809 kilogrammes, or 283,429 troy ounces, equal, at 4*l.* per ounce, to the sum of 1,133,716*l.* sterling.

Silver is found in Chili, but the mines are in general not productive, except in the Cerro de Uspallata, twenty-four miles N.W. of the city of Mendoza, on the eastern side of the Andes, where an ore is worked which yields about fifty marcs of silver in every hundred pounds of ore. In Peru there are silver mines along the whole range of the Andes from Caxamarca to the confines of the desert of Atacama; but the richest are those of Pasco, in the eleventh degree of latitude, which have been worked since the year 1630. Here, as well as in other situations in Peru, the greatest part of the silver is obtained from an ore called in the country *pacos*, which, according to the analysis of Klaproth, is an intimate mixture of minute particles of native silver with brown oxide of iron. To form a just idea of the enormous quantity of silver in some of these mountains, it is only necessary to state, that in the mines of Pasco the ore has been worked without intermission since the beginning of the seventeenth century, and that in twenty years preceding 1803 no less than 5,000,000 marcs of silver had been obtained from them, and that too without in any case sinking deeper than about seventy fathoms, while most of the mines do not exceed fifteen fathoms in depth. The stratum of limestone in which the ore is contained lies exposed at the surface over an area of three miles by a mile and a half. The mines of Chota are also very productive. They are situated in the mountain of Gualgayoc, at an elevation of 13,300 feet, where the thermometer in summer descends every night to the freezing point. The ore lies quite at the surface, so that in removing the turf almost in any place, over an extent of half a square league, portions of sulphuret of silver and filaments of native silver may be met with adhering to the roots of the grass. The ore is richer than that of Pasco, and yielded on an average of twenty-eight years prior to 1803, 67,193 marcs of silver annually. In the district of Arica, on the very borders of the Pacific, at Huantajaya, there are mines of silver which are celebrated on account of the very large masses of pure solid silver sometimes found there, one of which weighed eight hundred pounds. The most renowned of all the silver mines of South America are those of Potosi in Upper Peru. They are situated in a lofty mountain called the Cerro del Potosi, composed of clay-slate covered by porphyry, and rising to the height of 16,000 feet above the sea, the town of Potosi itself being 2700 feet below the summit. The mountain is perforated in all directions, and it is said that there are not less than five thousand excavations in it, some of them within 120 feet of the top; indeed the works have hitherto been almost confined to the higher parts of the mountain for the sake of more easily getting rid of the water, but an adit or drain, more than a mile and a quarter long and fourteen feet square, has been constructed in order to carry off the water from the lower mines. There are rich veins of silver in several parts of New Granada, but no mines have yet been found sufficiently productive to pay the expense of working them. The annual produce of silver from the mines of Chili, Peru, Buenos Ayres, and New Granada, is stated by Humboldt to have been at the commencement of the present century 258,069 kilogrammes, which is equal to 691,492 lbs. troy, and if we take the silver at only five shillings the ounce, it gives a sum of 2,074,476*l.* sterling. The produce of the mines of Potosi are included in the returns from Buenos Ayres.

Mercury, or **Quicksilver**, is found in many parts of the Andes, not in a pure and fluid state, but in combination with sulphur, forming that particular red ore of mercury called cinnabar. Near the village of Azogué, (the name of which means quicksilver,) north-west of Cuença, the ore is found in a quartzose sandstone, 4600 feet thick, containing fossil wood, and asphaltum or mineral pitch. It is found in many parts of Peru, but the most celebrated quicksilver mines of South America were those situated in the mountain Santa Barbara, near the town of Guancavelica, until they were accidentally destroyed. The mountain is 12,300 feet above the level of the sea: the cinnabar occurs in the form of layers and of veins in a sandstone, almost as compact as pure quartz, thirteen feet thick, forming a subordinate bed in a calcareous breccia, that is, a rock composed of fragments of limestone cemented together, resting upon, or rather being a part of the extensive formation of magnesian limestone, which, in this place, abounds in pectens and cardiums. These mines were worked by the Spaniards as far back as the year 1570, and from documents which have been regularly kept, it appears that they had in general yielded annually from 400,000 to 600,000 lbs. of quicksilver, and in some years as much as 1,050,000 lbs. But in 1789, an ignorant superintendant, wishing to increase the produce, caused the miners to work the masses which had been left to support the roof, as is usually done in coal-mines; the consequence of this was, that when these pillars were taken away the roof sunk down to the floor of the mine, and closed it.

Platina is met with only in the provinces of Choco and Barbacoas, in the north-western part of Colombia, west of the sandstone mountains on the left bank of the Cauca, in the same alluvium from which the chief part of the gold of New Granada is obtained, but only in the form of grains, for it has not been found united with any matrix. The grains are usually small, lumps being very rare; the largest of those hitherto found, which is in the Royal Museum at Madrid, weighs no more than twenty-one ounces.

Copper is found in Peru, and is by far the most valuable of all the metallic productions of Chili. The mines are chiefly in the northern provinces of Coquimbo and Copiapo, but there are also some of great value in the southern provinces, or rather in what is usually termed the country of the Araucanos. The average annual produce of Chili in copper is estimated at 14,000,000 lbs., and it is exported to the United States, China, the East Indies, and many parts of Europe.

Tin is also found in Chili, and forms an article of export.

End of Volume the First.

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